ONTARIO GEOLOGICAL SURVEY
MINERAL DEPOSITS CIRCULAR 19

Some Peat Moss and Peat Deposits in Selected Areas

Districts
of
Nipissing, Sudbury, Algoma, Thunder Bay, and Kenora

by

R. Bruce Graham

1979

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Deputy Minister

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MEASUREMENTS IN ONTARIO GEOLOGICAL SURVEY PUBLICATIONS

All the measurements in this report are given in the units used in the source materials or in the original measuring. If the reader wishes to convert Imperial Units to Metric or SI Units or SI Units to Imperial Units the following multipliers should be used:

Unit	*Multiplied by*	*Gives*	*Unit*	*Multiplied by*	*Gives*
		LENGTH			
1 mm	0.039	inches	1 inch	25.4	mm
1 cm	0.394	inches	1 inch	2.54	cm
1 m	3.281	feet	1 foot	0.3048	m
1 km	0.621	miles (statute)	1 mile (statute)	1.609	km
		AREA			
1 cm^2	0.155	square inches	1 square inch	6.452	cm^2
1 m^2	10.764	square feet	1 square foot	0.093	m^2
1 km^2	0.386	square miles	1 square mile	2.590	km^2
1 m^2	0.000247	acres	1 acre	4046.686	m^2
1 h	2.471	acres	1 acre	0.405	h
		VOLUME			
1 cm^3	0.061	cubic inches	1 cubic inch	16.387	cm^3
1 m^3	35.315	cubic feet	1 cubic foot	0.028	m^3
		CAPACITY			
1 l	1.760	pints	1 pint	0.568	l
1 l	0.880	quarts	1 quart	1.137	l
1 l	0.220	gallons	1 gallon	4.546	l
		MASS			
1 g	0.035	ounces (avdp)	1 ounce (avdp)	28.350	g
1 g	0.032	ounces (troy)	1 ounce (troy)	31.103	g
1 kg	2.205	pounds (avdp)	1 pound (avdp)	0.454	kg
1 kg	0.0011	tons (short)	1 ton (short)	907.185	kg
1 t	1.102	tons (short)	1 ton (short)	0.907	t
1 kg	0.000984	tons (long)	1 ton (long)	1016.047	kg
1 t	0.984	tons (long)	1 ton (long)	1.016	t
		CONCENTRATION			
1 gm/t	0.029	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.292	gm/t
1 gm/t	0.583	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.715	gm/t
1 ounce (troy)/ ton (short)	20.0	pennyweights/ ton (short)	1 pennyweight/ ton (short)	0.05	ounce (troy)/ ton (short)

Suggestion: Although the above conversion factors are given to several decimal places for your convenience, do not attempt to convert an approximate measurement to a precise measurement. For example, "about 1000 feet" should be converted to "about 300 m" rather than "304.8 m".

Abstract

Canada is the major North American source of horticultural grade peat moss. The use of peat, the humified form of peat moss and other peat forming plants, is confined to Europe where it is used as a fuel for the generation of electricity, for heating, and to a minor extent for medicinal purposes. Due to increasing costs of conventional energy sources and projections of worldwide shortages, there is growing interest in the possibilities of peat as an alternative energy source.

A program to investigate horticultural peat moss and peat resources adjacent to major transportation routes was carried out during the field seasons of 1975, 1976, and 1977. Twenty-one deposits were examined. The deposits were selected from an air photograph study and vary in area from 93 ha to 2050 ha. The latter lies within an open bog of some 3850 ha.

Total identified peat moss resources of sufficient thickness to permit harvesting are equivalent to 16,244,000 six cubic foot bales. These are divided among seven deposits. The two largest are Deposit 25: Trewartha Township containing a resource of approximately 7,463,000 bales and Deposit 24: Stedman Township containing about 4,000,000 bales.

Total identified fuel peat resources amount to over 160 399 000 m^3 of peat in place representing $>$ 37 883 000 tonnes of peat at 55 percent moisture.

A substantial potential for peat is present in the Lyon Township group of bogs and in the Stedman, Trewartha, Meinzinger Township deposits. In the former there is a resource of 28 700 000 m^3 of peat in place representing some 6 270 000 tonnes of peat at 55 percent moisture. Based on European standards adjusted to Canadian conditions, this is sufficient to supply an 18 to 20 MW plant for 38 years. In the latter group there is a resource in excess of 83 642 000 m^3 of peat in place representing over 20 441 000 tonnes of peat at 55 percent moisture. This is sufficient to supply a 40 to 44 MW plant for over 50 years. Since only 52 percent of the Meinzinger deposit was examined, further investigation would enlarge the estimated peat resources of this group.

Deposit 27: McNevin Township represents a more modest peat resource of $>$ 17 600 000 m^3 of peat representing $>$3 907 000 tonnes of peat at 55 percent moisture. This would be sufficient to supply a 10 MW plant for over 50 years.

The results of the investigations will assist in land use and ecological planning and provide assistance in the preparation of an inventory of these resources when required.

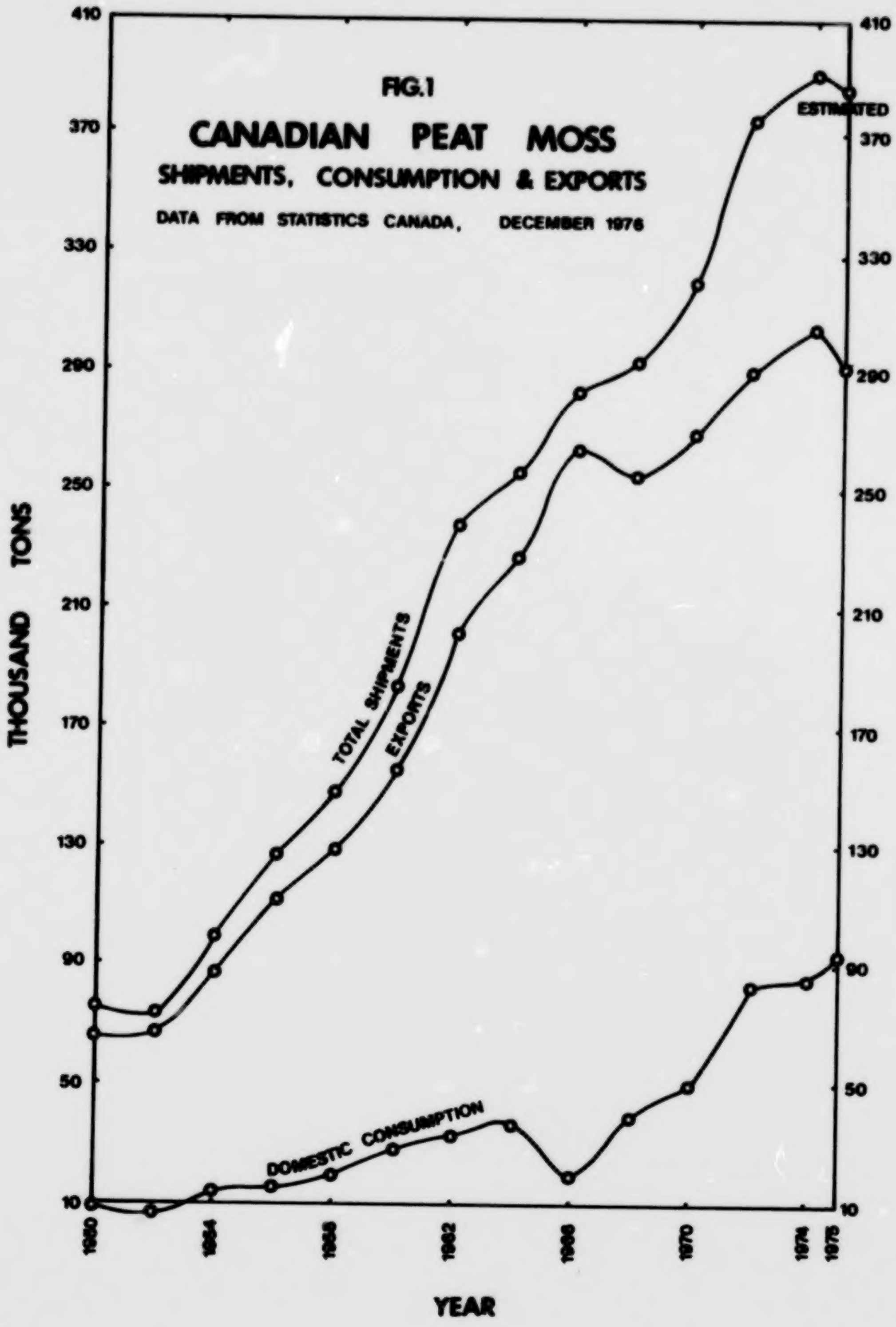


FIG.1

CANADIAN PEAT MOSS

SHIPMENTS, CONSUMPTION & EXPORTS

DATA FROM STATISTICS CANADA, DECEMBER 1976

Some Peat Moss and Peat Deposits in Selected Areas Districts of Nipissing, Sudbury, Algoma, Thunder Bay, and Kenora

By

R.Bruce Graham[1]

Introduction

The demand in Canada and the United States for peat moss has been increasing with minor fluctuations since the end of World War II. Canadian production in 1946 was 79 800 tonnes according to Statistics Canada. By 1977 it had reached an estimated 433 000 tonnes. Referring to Figure 1, it can be seen that the rate of growth has been strongest subsequent to 1952[2].

For many years domestic consumption remained fairly uniform at about 13 percent of production, but since 1967 domestic consumption has been increasing and by 1976 had reached 24.8 percent of total production.

The growing demand for peat moss is indicative of a healthy industry.

Ontario has a particularly advantageous position relative to Manitoba, Quebec, and Maritime producers with respect to the United States market. This applies particularly to most of the province close to its southern borders. In such states as Ohio, Indiana, Missouri, Michigan, Wisconsin, Illinois, Iowa, and Arkansas, the province would have a favourable freight differential with regard to out of province producers.

Ontario production of horticultural grade peat moss occupies a minor position with respect to total Canadian production.

Since 1970, Ontario's share of Canadian production has decreased, see Table 1. This is largely due to the lack of recognition of viable deposits in favourably located areas, consequently no new production is coming on stream.

In order to improve Ontario's position in the peat moss industry, the Ontario Ministry of Natural Resources has instituted a program of field investigation of selected areas to locate horticultural grade peat moss deposits.

Also, the high and increasing cost of conventional energy sources and projections of worldwide shortages have stimulated investigations into alternative supplies. The use of peat in Europe for the generation of electricity and for heating attests to its potential value as an alternative in Canada. Consequently, the information on fuel potential obtained from the current investigation could be valuable in the future.

TABLE 1*
PEAT PRODUCTION, ONTARIO

Year	Production Tonnes	Percent of Canadian Production
1969	20,671	6.9
1970	20,865	7.2
1971	17,227	5.6
1972	12,300	3.6
1973	8,068	2.4
1975	10,363	2.9
1976	8,719	2.2
1977 (est.)	9,000	2.1 (est.)

*Statistics, Ontario Ministry of Natural Resources, 1977.

The investigations will also assist in land use and ecological planning, and provide information to assist in the preparation of an inventory of peat resources when required.

The metric system has been used in most instances. However, the industry has not yet been converted to the metric system with respect to volumes and weights of bales. In such cases the Imperial measure is retained to avoid confusion.

ACKNOWLEDGMENTS

The field work was carried out for the Ontario Ministry of Natural Resources by R. Bruce Graham and Associates Limited. The author was assisted in the field during 1975 by Robert Lee and R. Goudreau, during 1976 by Tony Marco, John Duncan and Richard Gordon, and during 1977 by Robert Lee and Damien Bourgoin. Dr. Roy F. Cain, retired from the Department of Botany, University of Toronto, and Dr. R. Ireland of the National Museum of

---

[1] R. Bruce Graham and Associates Limited, consultants to the Mineral Deposits Section, Ontario Geological Survey, Toronto. Approved for publication by the Chief, Mineral Deposits Section, 17 October 1978.

[2] Statistics Canada use shipments as the measure of production. This is approximate as not all moss harvested in a calendar year is shipped in that year.

Canada kindly identified some of the plants encountered in the investigation.

The laboratory work was carried out in the Geoscience Laboratory of the Ontario Geological Survey, Ministry of Natural Resources and this assistance and cooperation is much appreciated.

Acknowledgment is also due to J. Michalik and C. Storey of the Mineral Deposits Section, Ministry of Natural Resources and R. Guenther of R. Bruce Graham and Associates for the preparation of maps and sections.

Geology of Peat Moss and Peat Deposits

FORMATION OF PEAT MOSS AND PEAT DEPOSITS

Canada's wetlands are commonly divided into three types: marsh, swamp, and bog or muskeg. Whereas peat forms an integral part of all wetland, peat moss deposits are restricted to bogs. Due to drainage and growth considerations, harvesting of peat is also restricted to bog areas. The following description of the formation of peat moss and peat deposits for practical purposes is confined to bogs although these, during their formation, may pass through marsh and swamp stages.

Photo 1–A typical open bog. Note hummocks of sphagnum and labrador tea (ledum). Grass grows on sphagnum. Looking northeast, 180 m northwest of site 1, Deposit 28: Cathcart Township.

Bogs are comprised of the accumulation of various types of mosses, sedges, grasses, and reeds. Relatively thick and unaltered accumulations of moss varieties are referred to as peat moss deposits from which sphagnum and hypnum moss may be commercially harvested, mainly for horticulture.

The bog-forming plants gradually become humified below the surface to form peat. On complete humification the peat is a dark brown to black, plastic, amorphous, homogenous material. This on burial and consolidation may eventually form coal.

Bogs vary in size from a fraction of a hectare to many square kilometres.

All significant peat moss and peat deposits in Ontario are postglacial and hence date from about 10,000 B.P. Their formation is controlled by topography, hydrology, climate, and the chemistry of the soil surrounding the deposits.

Growth accumulation takes place in poorly drained areas with a high water-table and where essentially stagnant reducing conditions exist. Growth is outwards and upwards. The type of growth depends to a large extent on the chemical content of the waters draining into the deposit (Largin 1972). Acid environments and dissolved salt concentrations of less than 50mg/l favour the faster growing peat-forming plants such as:

Sphagnum magellancium
Sphagnum fuscum
Sphagnum imbricatum
Eriophorum spessum
Sphagnum rubellum
Polytrichum juniperneum
Sphagnum flavicamans

Due to lack of mineral nutrients these areas are generally free of trees. With slightly lower acidity and higher salt contents, slower growing sphagnum and eriophorium varieties are favoured along with hypnum moss.

With increasing concentrations of salts, sedge appears, alder, birch, spruce, and tamarack become established and herbaceous plants tend to be present.

Changes in the water-table reflecting changes in drainage or climatic rainfall can modify the organic accumulation from a soft, wet deposit to one that is firm and dry or vice versa. The growth pattern will be affected producing different botanical accumulations which may occur as layering both regular and irregular within the deposit. Fluctuations of the water-table can result in rapid decomposition due to the introduction of oxygenated waters with attendant oxidation. This type of decomposition is characteristic of drained bogs and bogs that have been cultivated. It is not to be confused with humification which is much slower and occurs under reducing conditions.

The introduction into and superposition over parts of bog areas by mineral soil will deteriorate the moss plants as do forest fires.

Growth is best developed in a moist cool climate and inhibited in warm, arid climates (Bellamy 1972). Thus the Maritimes, the arctic, and much of the interior of Canada is favourable for the growth of peat plants. The Canadian prairies due to higher soil salinity and a drier summer climate do not favour bog formation (Ehrlich *et al.* 1953).

The moist maritime climate and attendant low salt content of the nutrient water favours fast growing sphagnum mosses. This accounts for the presence of numerous sphagnum bogs of good horticultural quality in the Maritimes, along the St. Lawrence as far as Quebec City, and the coastal areas of British Columbia. These fast growing mosses produce a dome or rise which may reach heights of 9 m above the margins of the deposit.

The climate of the interior of Canada is not as moist. Drainage from the undulating glaciated terrain commonly has a higher mineral content, consequently raised bogs do not occur and the proportion of open bogs containing commercial thicknesses of sphagnum is not as great as in the Maritimes.

Peat moss and peat deposits can change their morphology appreciably with time. Peat growth can be extensive enough to be noted on air photographs in 20 years (Pollett 1968, p.70). A measurable crown or dome can form in 60 years where there was once a creek (Graham 1974). Lakes can form on bogs, change shape, or fill in in 12 to 30 years (Auer 1930; Leverin and Cameron 1919; Boatman 1972).

The nature of the deposit can change internally as well. In some deposits on Prince Edward Island, humification has resulted in a decrease of horticultural grade moss of 30 to 35 percent by volume over a period of 60 years although the thicknesses of the deposits are nearly the same as they were (Graham 1974). This is a significant factor when reviewing old data with respect to reserve estimates.

The effect of drainage and traffic can decrease appreciably the volume of peat moss and peat in a deposit. Measurements at Rivière du Loup, Quebec (Anrep 1914; Graham 1975) and at Fenton Fen, England (Fowler 1933) over a period of 64 to 80 years indicate a decrease in thickness of 50 to 55 percent.

Trees can completely overgrow a bog or encroach into open bogs as much as 450 m in 15 years (Graham 1974, Lyon Township No.13). When assessing bogs for tree growth density from airphotos, the date of the photography thus becomes important.

CLASSIFICATION

There are four main physiographic types of peat bogs:

(1) High Moor Raised or domed bogs which are elevated above their perimeter.

(2) Low Moor or Fen These occur in gently sloping basins on mineral terrain or in bedrock depressions due to glacial scouring. They are not raised above their perimeters and are flat to gently undulating.

(3) Blanket These occupy slopes, undulating uplands or occur on hills.

(4) Transition Areas between high moor bogs or low moor bogs with incipient doming are referred to as transition bogs.

All types may occur in maritime areas but only the low moor type has been recognized in the interior of Canada.

The following briefly summarizes the stratigraphic characteristics of the various classes.

The domed portion of high moor bogs is predominantly composed of fresh to slightly humified sphagnum mosses resting on a transition zone consisting of a mixture of humified and fibrous peat. This in turn rests upon a bottom layer consisting of a mixture of humified and fibrous peat. This in turn rests upon a bottom layer consisting mainly of residues of various types of mosses and sedges. Such deposits may attain thicknesses of up to 12 m whereas the upper unhumified layer may be over 6 m thick.

Canadian low moor deposits have a sphagnum top layer of from 0.2 to 2.5 m thick and average 0.5 to 1 m. The sphagnum overlies fibrous to amorphous peat. The peat may contain strata and lenses of less humified sphagnum, hypnum, reeds, or sedge. These deposits generally have depths of 2.5 to 5 m but depths of up to 8 m have been recorded (Nystrom and Anrep 1909).

Blanket deposits have a greater variety of layering than do high moor deposits. This layering can be continuous or discontinuous. An upper relatively unhumified sphagnum layer may be present but more often there is an accumulation of sedge and eriophorum with or without sphagnum. These varieties are underlain by relatively unhumified sedge and then by carex and or fibrous peat with a bottom layer of well humified peat. Not all varieties are necessarily present in a single deposit.

Photo 2–A bog cleaned and ready for production. Roxborough Township, Ontario.

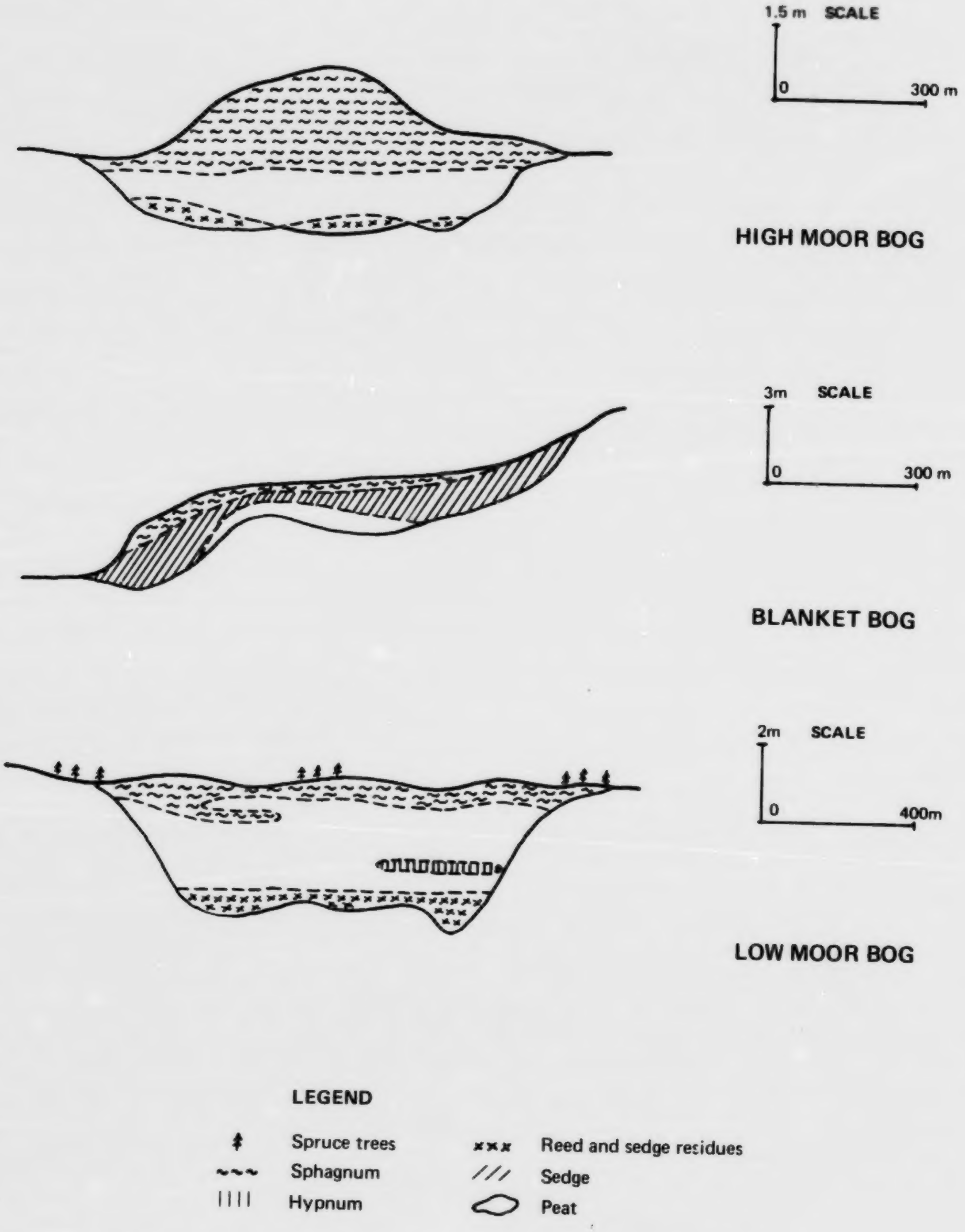

1.5 m SCALE
0
300 m
HIGH MOOR BOG
3m SCALE
0
300 m
BLANKET BOG
2m SCALE
0
400m
LOW MOOR BOG
LEGEND
Spruce trees
~~~ Sphagnum
|||| Hypnum
××× Reed and sedge residues
/// Sedge
Peat

Figure 2–Type Sections.
~~~

Typically all classes of bog rest on a clay, sand, or gravel bottom but in a few they rest directly on bedrock. Some deposits have a bottom layer of from 0.25 to 3.25 m thick of ooze which results from the accumulation of plankton or from a high lime content in the underlying soil. (Auere 1930).

Figure 2 represents diagrammatic type sections of the three main bog classes.

PROPERTIES OF PEAT MOSS

To satisfy the requirements for horticultural purposes, peat moss must be fibrous, elastic, relatively unhumified, and resistant to decomposition. As well, it must have the ability to add vegetable matter to the soil and must possess a high absorptive capacity. Its ability to retain water under moderately drying conditions contributes greatly to its value. The acidity of peat moss usually lies within a pH range of 3.5 to 5.5 and thus aids in the correction of alkaline soils.

As humification of peat moss increases, absorptive capacity and elasticity decreases and the colour becomes darker. The material becomes heavy and on drying is hard and brittle, disintegrating in the preparation process into an unsatisfactory product for horticultural purposes.

Different varieties exhibit the above properties to varying degrees and their characteristics are summarized in Table 2.

The elasticity and fibrous nature of peat forming plants vary. Eriophorum, reed, sedge, and carex plants are grassy varieties and the residue does not have a good cellular texture, whereas sphagnum and hypnum residues have both elastic and fibrous characteristics.

Visual examination is a reliable method for evaluating the quality of the moss. In order to supplement the descriptions of the physical characteristics of the material sampled in the field the following characteristics can be measured in the laboratory.

Absorption

Absorptive capacity decreases with the degree of humification. In general, the greater the absorption, the better will be the characteristics with regard to fiber content, elasticity, and ability to retain water. A lighter weight product will be obtained with attendant easier handling, drying, greater productivity, and lower transportation costs.

Volume Weight

Volume weights were determined on a dry and on a saturated basis.

The saturated wet volume dry weight, Column 7, Appendix III, gives a good assessment of the quality of the moss. A closer estimate of the bulk density of the moss at water contents of 30 to 40 percent can be made than with dry volume weights, Column 9, Appendix III.

Dry volume weights provide a good assessment of the moss but are less dependable than saturated volume dry weights due to the fact that foreign materials such as roots and mineral will affect the amount of shrinkage. A measure of shrinkage on drying to zero moisture can be determined by comparing wet volume dry weights with dry volume weights.

Ash

The ash content varies with the botanical origin, the humification, and foreign material such as roots or admixed mineral matter. It is not as specific as to quality compared to the above tests but does give an idea of the purity of the material, when compared with absorptive capacity and volume weight. In general, the lower the ash content, the better the horticultural quality.

Acidity

For certain specific purposes, such as soil correction and soil balance, the acidity of the peat moss applied must be known. It is given in terms of pH. The pH of the mosses in this study ranges from 3.4 to 6.4.

Moisture

The moisture content of the samples was determined to evaluate the degree of saturation in the deposit and its implication with respect to drainage. The average moisture content in the bogs examined varies from 80.1 to 93.3 percent.

Humification

It has been noted that, for horticultural purposes, peat moss must be fibrous and elastic. The greater the humification the less the moss will have these characteristics and as humification proceeds, the moss becomes peat. The degree of humification can, within limits, be determined from visual inspection in the field according to the von Post scale (von Post and Granlund 1926)(see Table 3).

In the area investigated, a top layer of green sphagnum 0.2 to 0.5 m thick is present in all deposits. Horticultural grade moss if present beneath this layer is sphagnum moss with a von Post value of H2 to H3.

Von Post values in the H3 to H4 range may be present in layers of sedge peat but the resulting product is too brittle and dusty for commercial use.

A description of the methods used and results obtained in the laboratory are given in Appendices II and III.

A study of laboratory results and field samples from the deposits examined indicate the following laboratory results to be indicative of horticultural grade material.

Absorption x own weight, dry basis: > 9
Dry weight/wet volume gm/cc: < 0.09
Dry weight/dry volume gm/cc: < 0.25
Ash (in percent): < 5
Acidity pH: 3.4 - 6.4
Humification von Post: H1 - H3

The above characteristics can be applied in a general way but all should be used in conjunction with the description of the physical characteristics in order to evaluate the sample in question.

For example, the absorption value as measured can also include water retained due to the fine-grained and/or porous characteristics of certain forms of peat and sedge. Absorptive values indicative of horticultural grade have been obtained from these materials but they are not of horticultural quality.

With respect to volume-weights, the presence of roots and reeds in horticultural grade material result ini anomalously high values. Such values of up to 0.43 gm/cc for dry volume weights have been obtained. The wet volume—dry weights are not as distorted by these materials. Values of 1.0 gm/cc were the highest obtained.

The ash was calculated on a dry basis. Whereas most of the horticultural moss has an ash content of 5 percent or less, anomalously high values of up to 20.2 percent due to roots and other foreign material have been obtained.

TABLE 2 CHARACTERISTICS OF DIFFERENT CLASSES OF PEAT (AFTER MINES BRANCH T.B. 55).

Major Classes	Subdivisions (Types) of Peat	Vegetation Sources of Peat	Colour of Peat	Texture of Peat	Structure of Peat
I. Sedimentary Peat	Oozy, macerated, or pulpy peat.	Aquatic.	Olive green, brown to black.	Coarse to very fine grained, pasty.	Amorphous, soft sticky, impervious.
	Calcareous sedimentary peat.		Grey to greyish brown or cream.	Coarse to finely divided.	Gritty, crumbly.
	Siliceous sedimentary peat.		Greyish brown to black.	Fine grained.	Plastic to friable.
Ia. Sedimentary Fibrous Peat	Cattail peat, tule peat, etc.	Marsh.	Dark brown to black.	Partly stringy fibred, sticky to platy.	Dense, plastic to lumpy.
	Reed peat.		Yellowish, reddish to dark brown.	Coarse to fine fibred, loamy to powdery.	Matted to felty porous, brittle.
	Sedge and carex peat.		Reddish brown to dark brown	Coarse to fine fibred, loamy to powdery.	Matted to felty porous, brittle.
II. Fibrous Peat	Hypnum moss peat.	Bog.	Yellowish brown to dark brown.	Fine fibred.	Loose to firm porous.
	Sphagnum moss peat.		Yellowish brown to dark reddish brown.	Coarse to fine fibred.	Spongy porous to fluffy.
IIa. Woody-Fibrous	Heath shrub peat.	Swamp forest	Brown to dark reddish brown.	Partly fibred, coarse fragmented.	Firm, lumpy.
	Willow-alder peat.		Brown to very dark brown.	Partly fibred to coarse woody, granular.	Sticky to loose crumbly.
	Bay shrub peat.		Brown to blackish brown.	Partly fibred to coarse woody, granular.	Compact, sticky to lumpy.
III. Woody Peat	Coniferous woody peat.	Swamp forest.	Reddish brown to dark brown.	Coarse woody, fragments to granular.	Loose to firm, lumpy or crumbly.
	Mixed woody peat.		Brown to dark brown.	Woody fragments to loamy granular.	Lumpy to friable.
	Deciduous woody peat.		Dark brown to black.	Woody fragments to loamy granular.	Lumpy to mellow loamy.

TABLE 3 LENNANT VON POST HUMIFICATION SCALE.

H 1: Completely unconverted and mudfree peat which when pressed in the hand only gives off clear water.
H 2: Practically completely unconverted and mudfree peat which when pressed in the hand gives off almost clear, colourless water.
H 3: Little converted or very slightly muddy peat which when pressed in the hand gives off marked muddy water, but no peat substance passes through the fingers. The press residue is not thick.
H 4: Slightly converted or somewhat muddy peat which when pressed in the hand gives off marked muddy water. The press residue is somewhat thick.
H 5: Fairly converted or rather muddy peat. Growth structure quite evident but somewhat obliterated. When pressed some peat substance passes through the finger, but mostly very muddy water. The press residue is very thick.
H 6: Fairly converted or rather muddy peat with indistinct growth structure. When pressed, at most one third of the peat substance passes through the fingers. The remainder extremely thick, but with more obvious growth structure than with unpressed peat.
H 7: Fairly well converted or marked muddy peat, but the growth structure can be seen, however. When pressed, about half the peat substance passes through the fingers. If water is also given off this has the nature of porridge.
H 8: Well converted or very muddy peat with indistinct growth structure. When pressed about two thirds of the peat substance passes through the fingers and at times a somewhat porridgy liquid. The remainder consists mainly of more resistant fibres and roots.
H 9: Practically completely converted or almost mudlike peat in which almost no growth structure is evident. Almost all the peat substance passes through the fingers as a homogeneous porridge when pressed.
H10: Completely converted or absolutely muddy peat where no growth structure can be seen. The entire peat substance passes through the fingers when pressed.

PROPERTIES OF PEAT

The fibrous nature, elasticity, and ability to absorb moisture of peat forming plants progressively decrease with increasing humification. Volume weights increase and the ash content may increase slightly.

In the deposits examined, all samples on the von Post humification scale of H4 or greater are sufficiently decomposed to be classified as peat. The laboratory results obtained from the peat samples lie mostly within the following range of values exclusive of those regarded as anomalous. Anomalous values are due to entrained rather than absorbed water, roots, and other foreign matter such as admixed soil. In some instances errors could appear where the available sample was too small to permit accurate measurements.

Absorption x own weight, dry basis: 4.5 - 9
Dry weight/wet volume gm/cc: 0.08 - 2.6
Dry weight/dry volume gm/cc: 0.21 - 0.5
Ash (in percent): 1.3 - 18.6
Acidity pH: 3.4 - 6.9
Humification von Post: H4 - H10

Representative samples from bogs in excess of 200 ha were submitted for determination of calorific values and the impurities sulphur and phosphorus. The calorific value of peat in the various deposits tested averages from 4571 to 4982 K cal/Kgm with the sulphur and phosphorus in each deposit averaging from 0.14 to 0.28 percent and 0.04 to 0.06 percent respectively.

For comparison some calorific values from other areas are listed below:

Irish Peat Fuel:
4,000-5,400 K cal/Kg (Flood 1972, McNerney 1977)
Finnish Peat Fuel:
4,400-5,300 K cal/Kg (Tibbetts 1976)
Minnesota Peat:
4,000-5,000 K cal/Kg (Farnham *et al.* 1976)
Newfoundland Peat:
3,700-5,700 K cal/Kg (Tibbetts 1976)
Most Canadian Peat:
4,400-5,280 (Haanel 1926)
Current Study:
4,571-4,982

Economy of Peat Moss and Peat

USES FOR PEAT MOSS

Canadian peat moss is almost exclusively used for horticultural purposes. Sphagnum moss is most often in demand although hypnum is also adequate. Previous to World War II the North American demand was largely supplied by Europe and Canadian production was negligible. Shortly after commencement of the war all imports of peat moss from Europe ceased and led to the active development of Canadian deposits.

Peat moss is an excellent soil conditioner. It adds porosity allowing better soil aeration, and retains moisture. It gives body to sandy soil and lightens heavy clay and therefore is very beneficial to gardens, lawns, golf courses, and racetracks. Peat moss acts as a carrier or diluent for chemical fertilizers. It is used as a seed inoculant, as an earthworm culture, and for mushroom beds. A growing use is in the manufacture of pots for plants. Minor uses are for swimming pool cushions, foundry facings, and in the brewing industry. Peat moss is an excellent packing material for perishable vegetables and for cut flowers. It is a deodorant and has been used as an insulator and for surgical dressings.

Potential uses for peat moss of fairly recent development are as a clean up medium for oil spills (D'Hennizel and Coupal 1972; Coupal 1972), as a filtering agent in sewage disposal (Farnham and Brown 1972; Lalancette and Coupal 1972; Tinh *et al.* 1971), as a medium for "instant lawns", and of the partially humified material as a binder in the pelletizing of iron ore (Vinezie and Cavanaugh 1971). Recent work in Russia on the use of sphagnum slabs in large-size panel construction has shown to advantage, particularly in northern climates. Peat moss panels are also used in Russia as partitions in the building industry (Sukhanov 1972). In Canada, the development of strong light-weight cement with peat moss is in progress (Directory Chem. Eng. Res. Canada 1970-1971).

Vermiculite, pumice, pearlite, straw, cedar bark, wood chips, sawdust, and peanut shells are substitutes for peat moss for certain restricted uses. Substitutes for peat moss used as chicken and stable litter and as an insulator have resulted in a decline in these uses although shortages in synthetic insulation could develop a renewed interest in peat moss for this purpose. The decline in the above uses has been more than offset by the evergrowing horticultural demand.

USES FOR PEAT

Peat has long been used in Europe as a fuel source and today is used in Ireland, Finland, and Russia as an energy source for the generation of electricity and for heating. In Russia in 1976, 80,000,000 to 85,000,000 tons of peat were produced of which 30,000,000 to 32,000,000 tons were consumed by 76 electric power plants to generate 4,000 megawatts (Ivaschichkin 1976). In Ireland 5,200,000 tons of peat were produced in 1976 for electricity and heating. This supplies a third of the Irish requirements. In Finland it is expected that the consumption of peat for electricity and heating will reach 3,000,000 tons by I980 (Tibbetts 1976). Whereas the major use of peat is for energy, activated carbon is also produced from peat (Eckman 1976) and production of gas from peat (Leppanialcee *et al.* 1976) is in the pilot plant stage.

In spite of its use in Europe peat is not used in Canada for fuel. Efforts to produce peat as fuel were carried out between 1864 and 1910 but it could not economically compete with coal and wood (Haanel 1926). Because of the accelerating costs of energy from conventional sources and anticipated future shortages, the use of peat as a fuel is being reviewed by the Ontario, Newfoundland, New Brunswick, and Federal governments.

Coking of peat produces tarry substances from which products similar to those obtained from soft coal can be obtained. Through chemical treatment, waxes, resins, tannins, cellulose, hemicellulose, humic acids, lignin, and hymatomelanic acid have all been recovered from peat. All these represent potential products when other cheaper sources are no longer available.

Peat deposits after draining have been used for market gardening in Canada and for grazing land and forestation in Newfoundland and Europe. The peaty soils are also used for growing blueberries and cranberries. Some bog and swamp areas have been classified as bird sanctuaries and as wilderness areas near urban centres such as Toronto.

RECLAMATION

The humified peaty soils left after harvesting operations have terminated are excellent for all the uses described in the preceding paragraph. The harvested bogs can also be converted into lakes and and hence have the potential for recreation uses or geese and duck sanctuaries.

ECOLOGY AND ENVIRONMENT

Peat bog waters are acidic and generally have a pH range of 4 to 5. The initial acceleration of run-off waters due to draining may temporarily disrupt the viability of aquatic invertebrate populations and effect the growth and survival of young fish in the drainage area.

Peat bogs are not an important habitat for wildlife and it appears that rare or endangered species of wildlife or plants are not significantly affected by bog development.

The main environmental impact from the harvesting of peat moss and peat is the creation of dust from the vacuum pickups and to a lesser extent from the processing plant. To date it does not appear to have presented a problem. This could in part be due to the fact that virgin bog areas in general have not been developed for agriculture in Canada and hence occur in regions or local pockets of sparse population.

PREPARATION AND HARVESTING

Pre-production requirements for peat moss and peat are, with one exception, similar regardless of the harvesting method employed. The exception is the hydropeat method.

Preliminary draining must be carried out to reduce the water content of the bog sufficiently to permit access of large tired or tracked vehicles for field preparation. This is achieved by one or more outlet and peripheral collecting ditches. These must be excavated into clay to facilitate water movement. It requires one to two years of preliminary draining before field preparation can begin in earnest.

When the deposit is firm enough, the surface is cleared and levelled and the water-table in the bog is lowered to 0.9 m below the surface by internal ditching.

The surface clearing and levelling is done by brush cutters, rotevators, and screw cutting machines. The in-

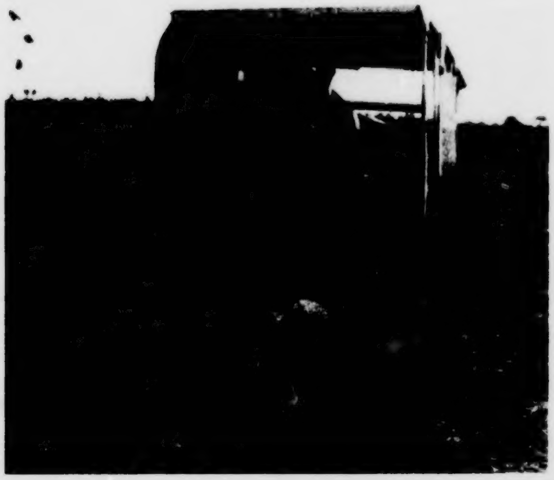


Photo 3–A German disc ditcher in operation, Roxborough Township, Ontario.

Photo 4–Sod-cutting machine. Bord na Mona, Ireland.

ternal ditching is carried out by draglines, light backhoes, wheel ditchers, chain ditchers, and other specialized equipment. These ditches are excavated in the bog to a depth of 0.9 m and are then incrementally deepened as the water level is lowered to the desired depth.

The lay out of the ditches will vary according to the topography of the surface and of the bottom of the bog, the degree of saturation and the wind direction, which is an important factor for natural drying. The minimum interval between ditches is generally 15 m to 30 m depending on the production method to be used. These ditches form the boundaries of the individual harvesting fields. In Europe the fields are cambered towards the ditches to facilitate drainage but this is not done in Canada.

After a further one to two years of drainage, harvesting can commence. During harvesting, the ditches are progressively deepened as the material is removed from the surface to maintain the water-table at the required depth.

Drainage can be seriously affected when a deposit is underlain by ooze. The weight of stockpiles and machinery can force the ooze upwards through the peat into the ditches. This will impede drainage and lower productivity.

Peat moss and peat are harvested mainly by the milled peat, milled vacuum peat, and the sod peat methods. A fourth technique, unique to Canada, is the hydropeat method. The milled peat method is not used in Canada at present.

MILLED PEAT

The first step is the milling of the surface layer to a depth of approximately 12 to 25 mm. This is done by rotating drums with projecting steel pins or knife blades. This layer is left to dry, generally for a day, and then turned over by spoon harrows to expose the underside to air drying. It can take several days to reduce the moisture content to the desired 40 to 55 percent. The milled material is then ploughed into windrows or ridges and removed by the Peco or Haku systems. In this method, as with the milled vacuum peat method, the wider the interval between ditches, the better the productivity. The limiting factor is the necessity for drainage.

Peco System

The Peco system involves the gathering of the milled peat or peat moss by a harvesting unit by which it is transferred through a long conveyor to the centre of the next field. This process continues through a series of fields until all the ridges are transferred into a central stockpile and removed by a narrow gauge railroad system. Alternatively the individual ridges may be loaded directly into a transportation unit and moved directly off the bog to a main stockpile.

If stockpiles are to be left for some time they may be compressed slightly to decrease the possibility of internal combustion and then covered with plastic sheets to protect the pile from moisture and wind loss.

After the removal of the ridges from each bog, the milling procedure is repeated.

Photo 5–Spoon harrow for turning milled peat. Bord na Mona, Ireland.

Photo 6–Peat-milling machine. Bord na Mona, Ireland.

Haku System

The Haku system differs in that the milled peat is stockpiled off one end of each field where it is finally covered with plastic sheeting until ready for transportation to the plant. It is then loaded into trailers with a shorter conveyor than is used with the Peco system.

MILLED VACUUM PEAT

The field is initially milled to a depth of 4 mm. One spoon harrowing is generally sufficient to dry the moss or peat as a thinner layer is prepared. Instead of windrowing, the peat is removed by vacuum pickups and stockpiled at the ends of the fields. It is then transported to a main stockpile by the Haku system. The stockpiles are prepared as in the milled peat method.

After the initial milling a miller is generally attached to the rear of the pickup so that harvesting and milling is carried out in one operation.

A variation of the milled vacuum method is used in Canada. The fields are not cambered as in Europe and the milling process is generally carried out by a spring tooth harrow which fluffs up the top 2 cm. When the moss is dry enough to produce the proper weight of bale it is taken from the surface by vacuum pickups. The dryness of the moss is determined by feel and is a matter of experience. The pickups remove the moss to the baling plant or stockpile it at various points on the bog for later removal to the plant by tractor drawn carts. As with the European method, more than one harrowing may be required between harvests.

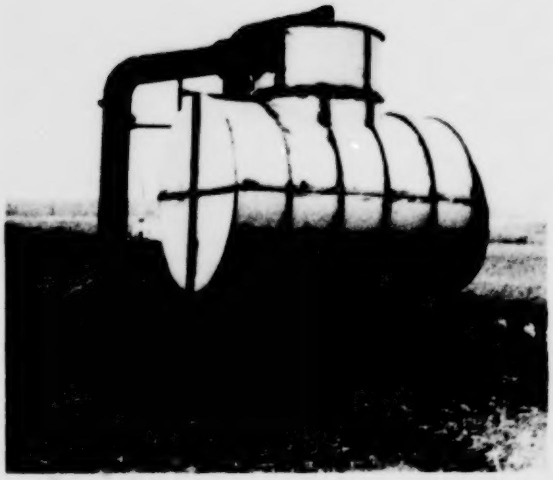


Photo 8–Vacuum pickup, peat moss. Roxborough Township, Ontario.

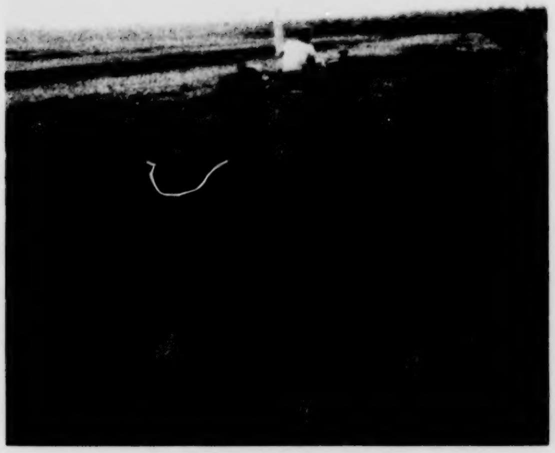


Photo 7–Spring tooth harrow for fluffing up peat moss. Roxborough Township, Ontario.

Photo 9–Dumping peat moss out of vacuum pickup onto stockpile. Roxborough Township, Ontario.

SOD PEAT

Field preparation is similar to the previous methods except that the ditch spacing is generally reduced to 15 m. Starting at the edge of a ditch, blocks approximately 46 x 15 x 10 cm are mechanically cut and stacked to air-dry.

Variations of this method involve a continuous buckett excavator and macerator mounted on self-propelled wide tracks. This equipment extrudes blocks of peat onto a spreader which spreads the blocks for air-drying. The blocks are periodically turned by a specially designed plow to reduce the moisture content to 35 to 55 percent. The blocks are then collected by a collecting machine which prepares stockpiles for loading and transport.

The Foiden method, developed in Ireland, mechanically macerates a thin layer of peat along a strip 14 m wide, picks it up, and forms the peat into small dense sods which have a moisture resistant surface. They are layered across the fields until dry and ridged into windrows in the centre of the field for removal. This method takes advantage of the dryer surface layer and consequently is more productive than the standard block-cutting method. The sod peat method is used on a small scale in New Brunswick. However, a bog must be nearly root free for efficient production and for this reason the method is little used in Canada.

The sod peat method is not as susceptible to delays incurred by wet weather as is the milling method and the quality of the product is better. However, it is more expensive than the milling method and the drying period is much longer, requiring a considerable quantity of blocks to be carried in enforced inventory during the drying period.

HYDROPEAT

The hydropeat method for the harvesting of peat moss is unique to Canada. Very little surface preparation is required and drainage is not necessary.

A sump is initially excavated and the moss is broken up by a monitor forming a slurry which is pumped through a pipeline to the dewatering plant where it is screened and the water partially removed.

Alternatively a barge may be floated in the excavation. A clam shell excavator or backhoe mounted on the barge excavates the peat from a working face and the peat is deposited on a grid on the barge. It is sluiced through the grid, being broken up in the process and forming a slurry in a reservoir in the barge. The larger roots are left on the grid and are removed by hand or by a conveyor which dumps the roots behind the barge. The slurry in the tank is pumped to the dewatering plant. Since the barge is floating it can be advanced as the excavation is enlarged. To ensure this mobility, proper bottom gradients must be maintained.

A variation has been developed by Western Peat Moss Limited. A clam shell excavator, hopper-grid, sluice, slurry tank, and conveyor for removal of roots from the grid are mounted on a hovercraft. The mobility of the equipment is thus independent of drainage and has greater flexibility of operation. The reader is referred to D. Hofler (1968), and J.B. Scott (1978) for more detailed descriptions of these methods of production.

PROCESSING

PEAT MOSS

Moss from the stockpiles is removed to the baling plant. At the baling plant, the moss is passed through a hammer or knife shredder onto screens to remove roots and oversize and from there into a bin. The bin feeds into balers. Various sized polyethylene packages are baled. The usual sizes are referred to as 6 cubic foot and 4 cubic foot bales. These contain compressed moss. The compression ratio is generally 2:1 although this may vary from plant to plant. Smaller sizes are also produced in both compressed and uncompressed or "loose-pack" form. Some specialty products are also made such as plant pots, bales compressed at 7:1 or more, and mixtures of peat moss and fertilizers. The purpose of the compressed bale is to permit easier handling and to take up less space during shipping, resulting in lower transportation costs.

Some operations have driers through which the moss is passed before entering the baling plant. The driers are used during periods of inclement weather when the moss cannot be air-dried to the required moisture content. If the

Photo 10–Baled peat moss ready for delivery. Roxborough Township, Ontario.

moss is too wet it clogs the shredder, the bales become too heavy to handle, and losses due to breakage of the bales increase. However, the capital cost and cost of fuel can appreciably affect the profitability of the operation. The horticultural quality is also adversely affected to some degree as the absorbability and fibrous nature decrease if the moss is dried at too high a temperature or too quickly.

The product from the hydropeat method requires more processing than that from the other methods. In the dewatering plant the water is removed by compressing between heated rollers or by vacuum extraction through screens or by a combination. The moss should be relatively coarse and unhumified to prevent clogging of the equipment. It is then passed through a drier, shredded, and baled.

The hydropeat method is not affected by rain or humidity and labour costs are lower. Consequently, this is a more dependable production method. However, capital costs and plant costs are much higher and not all forms of sphagnum are suitable for this method.

The trend in the industry in Canada has been towards use of the vacuum method. It is felt that the lower capital costs and higher productivity in good weather offset the disadvantages.

PEAT

The milled peat is transported to the power boiler site where the peat and contained roots are passed through a 30 cm grizzly. The oversize is removed for disposal. The peat is then passed into a bunker and is fed into a pulverizing mill. As the peat is pulverized hot furnace gases dry the peat particles from 55 percent moisture to 20 to 30 percent when fed into the burner. With respect to sod peat a delivered moisture content of 35 percent is preferred. The peat is discharged from bunkers into a pre-drying shaft where it is dried to about 30 percent moisture and is then fired on stoker grates in small industrial heating plants. It is also used for domestic heating.

Peat may also be briquetted for use as a fuel in generating stations but briquettes are used to a much lesser extent than milled peat. Peat with a humification degree of H 6 to H 8 is best for briquette whereas H 3 to H 5 peat is best for milled peat (Flood 1972).

Photo 11–Peat fueled power station. Bord na Mona, Ireland.

CLIMATE

All production methods excepting hydropeat are primarily dependent on natural drying. Consequently for each bog the amount of rainfall, humidity, sunshine hours, wind direction, wind velocity, fog, and humidity should be studied in order to determine whether or not drying conditions are comparable to other deposits where successful operations are being carried out. Weather station data averages supplemented by climatic maps have been used to provide pertinent weather data where available in the various bog areas examined. This data should be applied with caution as local variations in climate can affect the validity of this information. The deposits have been divided into four groups, each of which has a slightly different climate.

East Group Deposits

1: Springer Tp.
2: Loudon Tp.
3: Street Tp.
4: Street Tp.
5: Capreol Tp.
6: Capreol Tp.
7: Hallam Tp.

Sault Ste. Marie Group Deposits

8: Galbraith Tp.
11: Fenwick Tp.

Central Group Deposits

13: Lyon Tp.
15: Lyon Tp.
16: Lyon Tp.

West Group Deposits

18: Conacher Tp.
21: Fallis Tp.
22: Gibbard Tp.
23: Gibbard Tp.
24: Stedman Tp.
25: Trewartha Tp.
27: McNevin Tp.
28: Cathcart Tp.
29: Meinzinger Tp.

The East Group extends from 33 km west of North Bay to 72 km west of Sudbury. The Sault Ste. Marie Group extends from 48 km east of Sault Ste. Marie to 24 km northwest of Sault Ste. Marie. The Central Group is in Lyon Township, 85 km northeast of Thunder Bay. The West Group extends from 67 km to 179 km northeast of Thunder Bay.

Table 4 gives the available data with respect to drying conditions. Similar information for comparison is supplied for the Shippigan-Caraquet peat moss producing area in New Brunswick. The weather stations used in this instance are Bathurst and Campbellton.

TABLE 4 WEATHER AVERAGES JUNE TO SEPTEMBER INCLUSIVE.

	East Group	Sault Ste. Marie Group	Centre Group	West Group	Shippigan-Caraquet
Percent time more or less cloudy	58	56	65	61.5	59
Number of fog days	24.2	N.A.	N.A.	22	14
Number of days-measurable rain	46	43	46.5	49.8	46
Precipitation in cm	35.2	36.1	34.2	39.5	31.2
Excess of evaporation over precipitation in cm	6.7	5.4	8.2	3.7	1.3
Average temperature-degree C	16.6	15	13.7	14.4	16
Number of calm days	11	51	41[1]	27	7
Most frequent wind direction	SW	WNW to NW	W to SW[1]	W to SW	W to SW
Percent frequency	16	29	30.5[1]	26.5	23.1
Average wind speed km/hr	12	13	12.2[1]	14.6	13.3
Secondary wind direction	N or W	E	E to ENE[1]	S	E to ENE
Percent frequency	9.6	10.5	18.5[1]	9.5	11.8
Average wind speed km/hr	10	12.2	13.7[1]	12.9	11.3

[1] Thunder Bay Weather Station. Possibly not applicable as Centre Group lies 77 km to northeast.

Methodology

CRITERIA FOR SELECTION OF BOGS FOR FIELD EXAMINATION

The selection of bogs for field investigation was based on an airphoto study according to visible criteria with regard to potential production possibilities (Graham 1973).

The main requirements are a minimal tree growth with an adequate area and depth of horticultural moss and/or peat. Drainage should be easily accomplished and access transportation facilities should be convenient.

SURFACE GROWTH

Dense tree growth over a deposit dictates a high field preparation cost. Tree growth is also indicative of a root condition in the deposit which will increase operating costs. Hence, the selection of deposits was restricted to areas where there appeared to be insufficient surface growth to cause a clearing or production problem.

AREA AND DEPTH REQUIREMENTS FOR PEAT MOSS

The size of the open area can be determined from the air photograph. The depth of the deposit can be determined qualitatively to the degree that certain criteria will indicate depths of 0.6 m or less in many deposits. The quality of the moss cannot be determined from an air photograph with assurance. Whereas domed bogs generally contain horticultural grade moss, it is the writer's experience that it is not possible to determine the quality or type of material below the surface layer in low moor deposits in Canada from air photographs.

To be commercially attractive on other than a part time basis, a supply to support a minimum production equivalent of 75,000 to 150,000 six cubic foot (0.17 m) bales per year with a moisture content of 40 percent should be considered. The standard 6 cubic foot bale is compressed at a ratio of 1.5 to 2.5 and for the purpose of discussion will be considered as containing the equivalent of 12 cubic (0.34 m^3) of loose moss.

To determine the minimum area and depth to achieve the above objective, several factors must be taken into account.

Undrained peat moss deposits of good quality are in the saturated or near saturated state. On draining and drying there is shrinkage of moss with varying moisture contents. A determination on horticultural grade moss when dried to a moisture content of 30 percent gave a shrinkage of 50 percent (Leverin 1946, p.9). Thirty percent moisture content is nearly the optimum value to which moss can be field dried with the vacuum harvesting method and a 40 percent content would be a more realistic value with respect to most Canadian production. Two tests carried out in the Ministry's laboratories on Stedman Township sphagnum moss indicate a shrinkage of 47 to 56 percent on drying to 40 percent moisture content, and a bulk density of 0.21 gm/cc. It was also noted that the laboratory results support the concept that the bulk density at any moisture content can be calculated from the wet volume dry weight if applied to these shrinkage values.

For example, the average wet volume dry weight of the samples of sphagnum collected from the Stedman deposit is 0.06 gm/cc. It was calculated by using the average shrinkage of 51.5 percent at a moisture content of 40 percent that this moss contains $^{100}/_{100-51.5} \times 0.06$ gm = 0.12 gm which equals a bulk density of $^{100}/_{100-40} \times 0.12$ gm = 0.2 gm/cc when dry. This compares with a laboratory determination on the samples which were taken from the central part of the sphagnum area of 0.21 gm/cc. Moss at a bulk density of 0.2 gm/cc will weigh 200 kg/m^3 (12.5 lbs/cu ft.). The procedure for determining the wet volume dry weight is given in Appendix II.

When passed through the shredder the moss is fluffed up and the uncompacted volume is greater than the moss in place. The moss is then bagged, a 6 cubic foot bale (0.17 m) usually weighing between 70 lbs (32 kg) and 100 lbs (45 kg) depending on the quality of the moss and the moisture content. To achieve this weight the moss is generally compressed at 2:1 ratio after shredding. Assuming 40 percent moisture content and an average weight of 80 lbs (36.3 kg) for a 6 cubic foot bale, 80 lbs of baled moss will equate to 6.4 cubic feet of moss in place at 40 percent moisture content. Assuming the moss will shrink 50 percent on drying to 40 percent moisture, the amount of moss required for a bale in a virgin bog will be 12.8 cubic feet.

An approximation of reserves can be calculated in bales by the above method, adjusting for the wet volume dry weight of the field samples.

To allow for shrinkage and compaction by traffic on the bog, a minimum of 1.2 m (4 feet) of horticultural moss in the undrained state is required.

Experience has shown that by the vacuum method of harvesting, optimum productivity can vary from 300 to over 900 bales per 0.4 ha (1 acre) depending on drainage efficiency, weather, and type of moss. Therefore, for a production of 75,000 to 150,000 bales per year, the area required on a first approximation would be in excess of 40 ha.

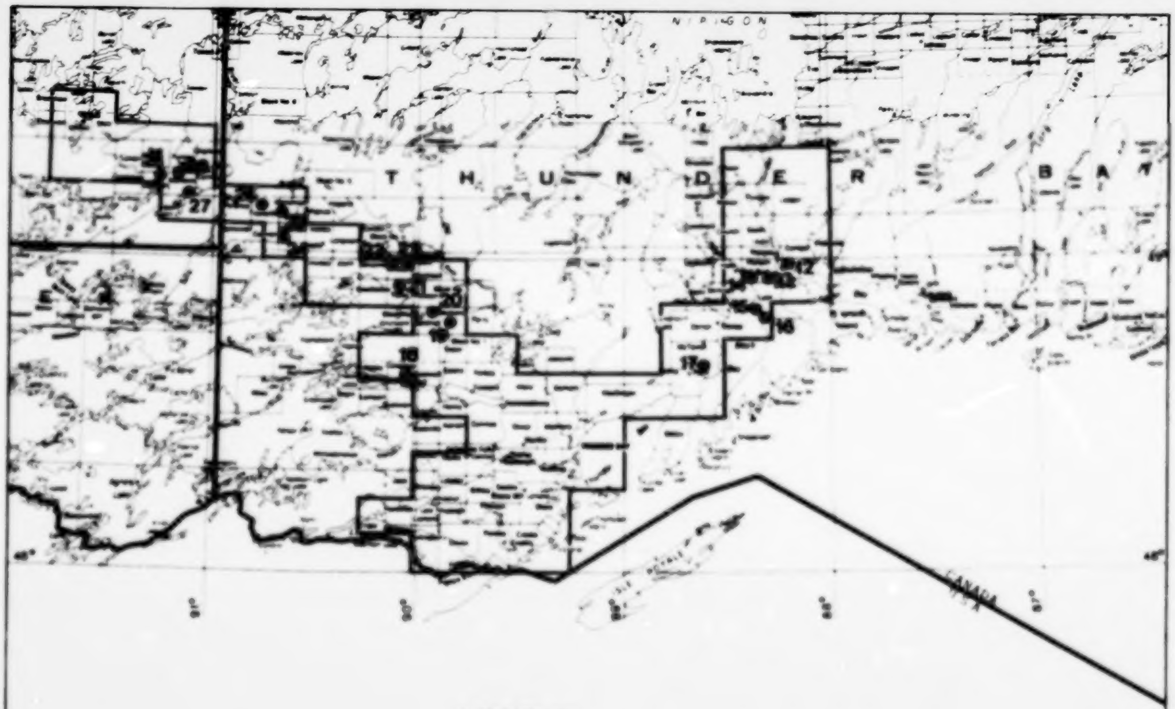
Reserves are thus only significant if area and depth requirements are met. Assuming the minimum requirements outlined above and a 25 percent loss of moss due to bog lay out and moss left at the bottom of the deposit, 40 ha would have a recoverable reserve of 765,000 bales.

AREA AND DEPTH REQUIREMENTS FOR PEAT

In view of the fact that peat is not currently produced in Canada, European parameters are used to provide a measure of area and depth. Since the major use of European peat is as a fuel for power generation, area and depth requirements are indicated with this use in view.

The initial selection criteria applied to bogs for fuel peat are the same as for horticultural moss but larger areas are required and experience has shown that it is desirable to have a thickness of 2 m or more. A thin unhumified surface cover is preferable.

The area required is based on the amount that can be



LEGEND

DEPOSIT NO.	TOWNSHIP	DEPOSIT NO.	TOWNSHIP	DEPOSIT NO.	TOWNSHIP
● 1	SPRINGER	● 13	LYON	● 25	TREWARTHA
● 2	LOUDON	● 14	NIPIGON	● 26	McNEVIN
● 3	STREET	● 15	LYON	● 27	McNEVIN
● 4	STREET	● 16	LYON	● 28	CATHCART
● 5	CAPREOL	● 17	Mc TAVISH	● 29	MEINZINGER
● 6	CAPREOL	● 18	CONACHER		
● 7	HALLAM	● 19	MICHENER		
● 8	GALBRAITH	● 20	GOLDING		
● 9	JOCELYN	● 21	FALLIS		
● 10	VAN KOUGHNET	● 22	GIBBARD		
● 11	FENWICK	● 23	GIBBARD		
● 12	CORRIGAL	● 24	STEDMAN		

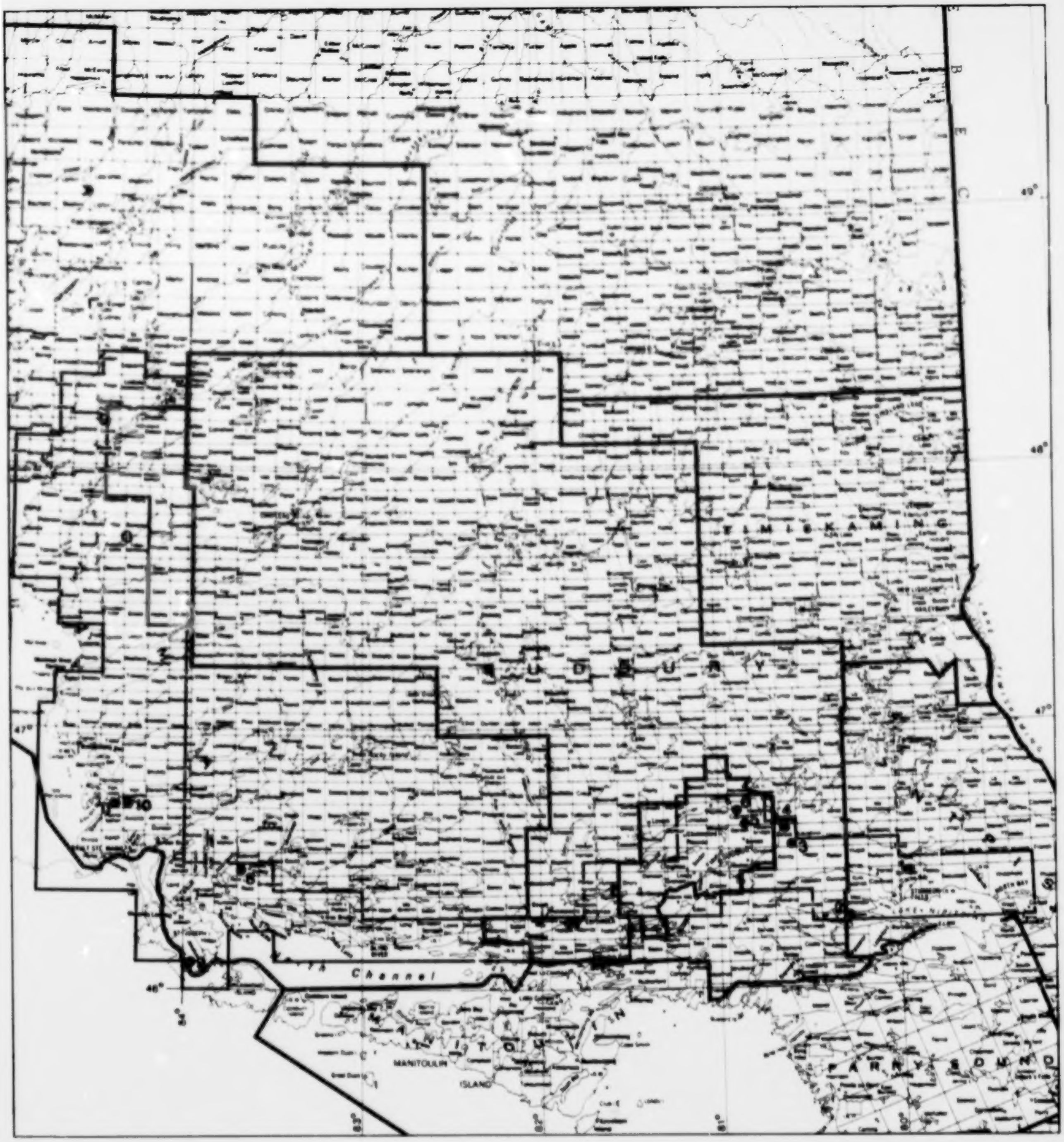
AREA INCLUDED IN AIR PHOTO STUDY

Figure 3

INDEX MAP

SHOWING LOCATION OF SOME PEAT AND PEAT MOSS DEPOSITS, EAST AND WEST-CENTRAL ONTARIO (SEPTEMBER 1978).

0 25 50 75 M
0 40 80 120 Km



B
E
C
49°
48°
47°
46°
TIMISKAMING
SUDBURY
Channel
MANITOULIN
MANITOULIN ISLAND
PARRY SOUND
83°
82°
81°
80°

harvested per hectare per season and the size of the generating plant. The following example is based on European experience (Flood 1972) adjusted where possible to Canadian conditions (Scott 1978). The requirements of various sizes of generating plants and necessary bog area to meet this requirement using the milled peat method are tabulated below.

Size Generating Plant MW	Tonnes Required per year (2)	Area Required Ha (1)
25	190,000	2,000
50	380,000	4,000
100	760,000	8,000
250	1,900,000	20,000

(1) Annual production of 113 tonnes/ha and 20 percent of total area not productive due to reservation for roads and stockpile areas and nonrecoverable peat.

(2) At 55 percent moisture and anhydrous calorific value of 5,000 K cal/Kg.

It can be seen that large areas are required to satisfy the requirements for industrial fuel peat. Generally, if a sufficient area of minimum depth is present in a single deposit, reserves are sufficient for at least 60 years of operation. An open bog of sufficient size in a suitable location may not occur and peat due to its bulk is expensive to transport from a remote location. This problem can be resolved to some degree by harvesting from clusters of smaller deposits that are within several kilometres of each other. In such situations a minimum area of 120 ha has been found practical in Ireland (Flood 1972). Conditions in the area studied might require a minimum area of 170 ha. Reserve life might then be reduced to 35 to 40 years because of the smaller bog units involve.

To obtain an approximation of reserves of peat at 55 percent moisture, shrinkage of the peat with loss of water and the bulk density must be considered. For example, tests carried out in the Geoscience Laboratories of the Ontario Geological Survey on eight samples of H 4 to H 6 peat from Deposit 24: Stedman Township and Deposit 29: Meinzinger Township indicated on a best match basis a shrinkage of from 43 to 50 percent on drying to 55 percent moisture with an average of 48 percent. The bulk density ranges from 328 to 435 kg/m^3.

As with horticultural moss, wet volume dry weights when applied to the appropriate shrinkage and moisture values give bulk densities closely approaching those obtained from laboratory tests.

Thus by applying the bulk density as indicated from the wet volume dry weight at a moisture content of 55 percent and a shrinkage factor of 48 percent, an approximation of the reserves of peat can be made based on the number of cubic metres of peat in place.

DRAINAGE

There must be a sufficient drop in elevation to allow drainage from the bog to reach a level below the depth of the commercial moss. Ditching is required to achieve this and the amount required can be an important item in the capital cost. Published topographic maps are generally not in sufficient detail to be of use with regard to determining the feasibility of drainage.

Information on drainage of the deposits examined was restricted mainly to stereoscopic inspection of air photographs, location of lakes, the presence of streams and of existing drains as well as observations in the field. Most of the bogs examined would require elevations to be taken along proposed drainage outlets.

ACCESS AND TRANSPORTATION

The bogs selected for field examination all lie adjacent to railways and to paved highways.

AREAS INVESTIGATED

The deposits investigated in the field were selected from two areas developed for study (Graham 1973). The initial selection was guided by access to main transportation routes and with reference to the Michigan-Alabama-Oklahoma-North Dakota area as a market for horticultural grade peat moss. The selection of individual deposits was guided by the previously referred to requirements.

One area comprises a strip centred along the Canadian Pacific Railway and Highway 17, from North Bay to Sault Ste. Marie and then north along Highway 17 and the Algoma Central Railway to Franz.

The second area extends along the railways and Highway 17 from Nipigon to Thunder Bay, then west and northwest from Thunder Bay along the Canadian National Railways and the Canadian Pacific Railway for 80 km where the two railways diverge. From there the area extends west along Highway 17 and the Canadian Pacific Railway as far as Ignace.

The outline of the areas covered by airphoto study is shown on Figure 3 and total some 34,450 km^2. Within this area, twenty-eight potential peat moss deposits were recognized. One additional deposit (Deposit 29: Meinzinger Township) was not included in the airphoto study but was partially investigated in the field. Twenty-one of the twenty-nine deposits were sampled. The eight deposits not investigated had low ratings and are listed below:

Deposit 9: Jocelyn Township
Deposit 10: VanKoughnet Township
Deposit 12: Corrigal Township
Deposit 14: Nipigon Township
Deposit 17: McTavish Township
Deposit 19: Michener Township
Deposit 20: Golding Township
Deposit 26: McNevin Township

SURVEY METHOD AND SAMPLING

The objective of the field work was to determine on a reconnaissance basis the peat resources present and whether horticultural grade peat moss occurs in sufficient quantities to warrant more detailed investigation.

Sample sites on each deposit were selected to fulfill this objective. Sample spacing varied from 90 to 1600 m.

The spacing between the sample sites was influenced by the material obtained during the sampling.

A total of 153 sites were sampled in the deposits examined.

The chain-and-compass method was used for locating the sampling sites in the smaller deposits. These locations were corrected where indicated by reference to recognizable landmarks on the air photographs. They were then plotted in the field on an acetate overlay, along with any other significant topographic features.

A J-5 Bombardier was used for transportation on the larger deposits. The sample points were located by means of a gimbled compass mounted on the J-5 and a topochain. These locations were located and corrected as previously described. For Deposit 16, Lyon Township, access was by helicopter, and sample sites were located directly from the airphotos, supplemented by chain-and-compass measurements. Reproductions of the photographs are used in this report to illustrate the descriptions of the deposits.

The reconnaissance sampling was carried out by means of the Davis sampler and the Djos Peat Borer.

The Davis instrument is a pitson type sampler. It consists of a sample chamber 1.9 cm in diameter by 50 cm long and a piston, one end of which is tapered to a point to allow easy movement through the material of the bog. Extension rods 1.15 m long are screwed into the sampler and to each other. On sampling, when the desired depth is reached, the piston is drawn into the sample chamber by pulling upwards on the handle. This upward motion is arrested automatically by a locking device. The open sample chamber is then pressed down into the bog wherein the material from the bog is forced into the sample chamber thereby allowing the recovery of the sample core.

The Djos Peat Borer has wide acceptance in Europe. It is so designed that the sample chamber is closed when the sampler is being inserted into the bog. When the sampler has reached the depth where the sample is to be taken, by turning the handle the sample chamber is opened. Continued turning of the handle causes peat material to be turned into the sample chamber by the action of the knife-edge lip of the sample chamber. Turning the handle in the opposite direction closes the sample chamber, preventing contamination of the sample.

The sample chamber is 2 cm in diameter and is 50 cm in length. The connecting rods are 98.75 cm long and marked at 0.5 m intervals.

The Davis sampler does not recover the top layer of green moss. Also the sample can be lost in horizons where the moss is dispersed in water. Where bogs are abnormally highly saturated with water, the water may be sucked into the chamber when the piston is withdrawn, preventing full entry of the material to be sampled into the chamber. This along with plugging of the orifice on penetration will require the collection of supplementary samples from time to time.

As with the Davis sampler, the Djos has difficulty recovering the top ⅓ m or so of green top moss. However, the core recovered is larger, permitting a sufficiently large sample to be collected in a single increment for qualitative analyses in almost all cases. Because the sample chamber is closed after sample collection, there is no loss of material when withdrawing the sampler from the bog. The sampler is stronger than the Davis type and better penetration through rooty ground can be achieved.

The main disadvantage of the Djos Peat Borer is the much longer time required to take and collect the samples from a sample site compared to that required by the Davis sampler. Also, if required, a complete section of the deposit collected in successive samples can be laid out with the Davis sampler, whereas the samples are disturbed when removed from the Djos sampler.

The two methods give comparative results in the laboratory (Graham 1974: Graham and Tibbetts 1965).

From the results indicated to date the writer is not certain that the advantages of the Djos sampler are warranted when considering the extra time required by this method. The technique favoured where good core recovery is not obtained by the Davis sampler is to collect supplementary samples with the Djos sampler.

POTENTIAL RESOURCES

For general inventory purposes an assessment of the potential resources for both horticultural grade peat moss and for peat, based on reconnaissance sampling, is provided in Table 5.

Although modest with respect to current producers, of the deposits examined Deposit 25: Trewartha Township, and Deposit 24: Stedman Township, have the best potential for horticultural grade peat moss.

Deposit 27: McNevin Township, Deposit 6: Capreol Township, Deposit 8: Galbraith Township, Deposit 1: Springer Township, and Deposit 3: Street Township in decreasing order of magnitude, also have horticultural grade moss of sufficient depth to harvest but their potential is limited.

The remaining deposits are regarded as resources for peat fuel. In calculating the potential peat resources, the peat underlying the areas containing a minimum of 1.2 m of horticultural grade moss was not included.

The peat deposits in Lyon Township lie in close proximity and could be grouped together as a unit. Using the parameters previously developed, there could be enough fuel peat present to supply an 18 to 20 MW generating plant for some 38 years.

Similarly there is an indicated resource potential grouping Deposit 24: Stedman Township, Deposit 25: Trewartha Township, and Deposit 29: Meinzinger Township to supply a 40 to 44 MW plant for over 50 years. However, only 52 percent of the Meinzinger deposit has been sampled and the ultimate potential will be greater. More extensive and more detailed sampling, quality determinations, drainage studies, and economic studies are required to provide a proper assessment with respect to reserves and development.

TABLE 5 POTENTIAL RESOURCES HORTICULTURAL PEAT MOSS AND PEAT.

Deposit	PEAT MOSS Area Hectares	Bales/40% Moisture	Cubic Metres In place	PEAT Area Hectares	Cubic Metres In place	Tonnes/55% Moisture[1]	Calorific Value K cal/Kg Average
1: Springer Tp.	6	469 000	109 000	80	+600 000	+133 000	
2: Loudon Tp.				140	1 685 000	336 000	
3: Street Tp.	4	147 000	53 000	48	481 000	74 000	
4: Street Tp.				89	1 465 000	527 000	
5: Capreol Tp.				219	+3 449 000	+611 000	
6: Capreol Tp.	12.7	1 234 000	349 000	92	+1 636 000	+363 000	
7: Hallam Tp.				116	2 466 000	602 000	
8: Galbraith Tp.	18	1 018 000	365 000	85.6	3 602 000	880 000	
11: Fenwick Tp.				125	1 052 000	397 000	
13: Lyon Tp.				300	6 300 000	1 539 000	4810
15: Lyon Tp.				930	16 700 000	3 213 000	4982
16: Lyon Tp.				340	5 700 000	1 517 000	4740
18: Conacher Tp.				72	1 487 000	462 000	
21: Fallis Tp.				70	935 000	228 000	
22: Gibbard Tp.				93	3 500 000	855 000	
23: Gibbard Tp.				313	8 100 000	1 798 000	
24: Stedman Tp.	55	4 000 000	1 459 000	208	4 742 000	+1 159 000	4571
25: Trewartha Tp.	164	7 463 000	2 600 000	1 336	+32 000 000	+7 820 000	4753
27: McNevin Tp.	100	1 913 000	500 000	840	+17 600 000	+3 907 000	4702
29: Meinzinger Tp.				2 050[2]	+46 900 000	+11 462 000	4803

Notes to Table:

[1] Tonnes estimated from average wet volume dry weight of samples collected and applying a reduction of 48 percent in volume.

[2] This deposit has a total area of 3 850 ha. There remains 1 800 ha to be investigated.

Description of Peat Deposits Examined

All deposits examined are of the low moor type. They are characterized by a hummocky surface layer of green sphagnum with locally some polytrichum or hypnum. Associated with this moss is usually a thick growth of labrador tea (Ledum). Leafy liverwort and leatherleaf are commonly present. A variety of grasses and reeds are also present with eriophorum predominating.

Selected samples were identified by Dr. R. Ireland, National Museum of Canada and Dr. Ray F. Cain, retired from the University of Toronto. These are listed below.

Sphagnum fallax (Klingr.) Klingr.
Sphagnum fuscum (Schimp) Klingr.
Sphagnum limburgii (Schimp)
Sphagnum majies (Russ.) C. Jens
Sphagnum megallancium (Brid)
Sphagnum memoreum (Scap)
Sphagnum papollosum Lindb.
Sphagnum teres (Schimp) Angstr. ex C. Hartm.
Polytrichum commune Hedw.
Polytrichum strictum Brid.
Cladopodiella Fluitans – leafy liverwort
Cethaloziella Sub-Dentada – leafy liverwort

Deposit 15: Lyon Township, Deposit 25: Trewartha Township, Deposit 27: McNevin Township, and Deposit 29: Meinzinger Township are characterized by flarks. Flarks are parallel, elongated, wet, muddy, shallow troughs up to a few metres wide in the sphagnum surface. They are due to surface stretching or creep apparently caused by internal drainage in the bog. Their orientation is perpendicular to the direction of drainage.

Flarks also occur on the shoulders of high moor bogs. Here, they are radially arranged and are due to outward creep because of the dynamics of growth within the dome. However, such deposits do not occur within the area examined.

Each deposit is described and a description of the material recovered at each sample site is given in Appendix i. Here the terms fine, medium, and coarse textured are used. These refer to fibre lengths which are classified as follows:

less than 1 mm - fine textured
1 to 2 mm - medium textured
greater than 2 mm - coarse textured

Also included is the degree of humification according to the von Post scale. The more important characteristics determined in the laboratory are given and indicated by the following abbreviations:

Absorption dry (times its own weight)	AD
Ash percent	Ash
Wet volume - dry weight gm/cc	VW
Not sufficient sample	NSS

The water content of the peat as collected, the pH, and absorption value at 40 percent moisture content are not included but are in the complete laboratory results given in Appendix III. Appendix IV gives the calorific value as well as the sulphur and phosphorus contents for peat from Deposit 14: Lyon Township, Deposit 15: Lyon Township, Deposit 16: Lyon Township, Deposit 24: Stedman Township, Deposit 25: Trewartha Township, Deposit 27: McNevin Township, and Deposit 29: Meinzinger Township. The remaining deposits are too small to be regarded as potential fuel sources at the present time.

The sample sites are shown on the airphoto which accompanies each description. The depth of the horticultural grade moss at the surface and the total depth of the deposit in metres is also shown.

The deposits are numbered in accordance with those described in the airphoto study (Graham 1973).

DEPOSIT 1: SPRINGER TOWNSHIP

Location

This bog is centred 2.8 km south and 4 km east of the northwest corner of the township. The town of Sturgeon Falls lies 4.8 km to the south.

Access

Highway 64 passes by the southeast end of the bog. A power line is adjacent to the road. A second east-west road lies 460 m north of the bog. The Canadian National Railways lies 3.4 km to the northwest.

Area

The open area comprises 80 ha. The long axis trends north-northwest and is 1.8 km long by 0.49 km wide.

Surface

The elevation of the bog rises slightly from either edge towards the long axis. Superimposed is a slightly domed area about 200 m in area centred 425 m from the southeast end.

The northwest and southeast extremities are wet and the green sphagnum layer has an overgrowth of grass and reeds. Elsewhere labrador tea, blueberry shrubs, and leafy liverwort predominate. The surface is hummocky and dry, with hummocks up to 0.6 m in height.

The tree growth is sparse except at the north and the northwest end where the average spacing is about 6 m. Elsewhere the trees occur mainly in clumps which are generally 30 to 75 m long and up to 30 m across. The trees are spruce and average 2.5 to 7.6 cm in diameter at the stump.

Depth

Due to the numerous roots present, bottom was reached only at sample sites 2 and 5 which are located in the domed area. Here the depth is 3.25 m.

Nature of Peat

An average thickness of 0.3 m of green sphagnum covers the deposit. Between sample sites 1 and 3 there is 1.8 m of horticultural grade moss although the lower 0.5 m will be dusty. This material has a wet volume dry weight of 0.09 gm/cc.

The horticultural grade material is fine to medium textured and elastic. It consists of 85 to 95 percent sphagnum with the remainder consisting of reeds and rootlets. It is underlain by humified sedge and amorphous peat. The water content at sites 5 and 6 varies from 87.7 to 92.5 percent and the ash content varies from 0.8 to 8.0 percent.

Drainage

Drainage into the bog is at the northwest end where it is submerged. There are two outlets along the east side. A beaver dam inhibits the drainage at the more northerly of the two outlets. The drainage flows into the Sturgeon River 4.2 km to the southeast. There are no apparent drainage problems with respect to this bog.

Comments

Access, transportation, and power are conveniently located with respect to this deposit and drainage does not appear to represent a problem.

The area of horticultural grade moss appears to be limited. Potentially, an area of 6 ha has been projected to have a depth of 1.8 m based on the results obtained at sites 1, 2, 3, and 5.

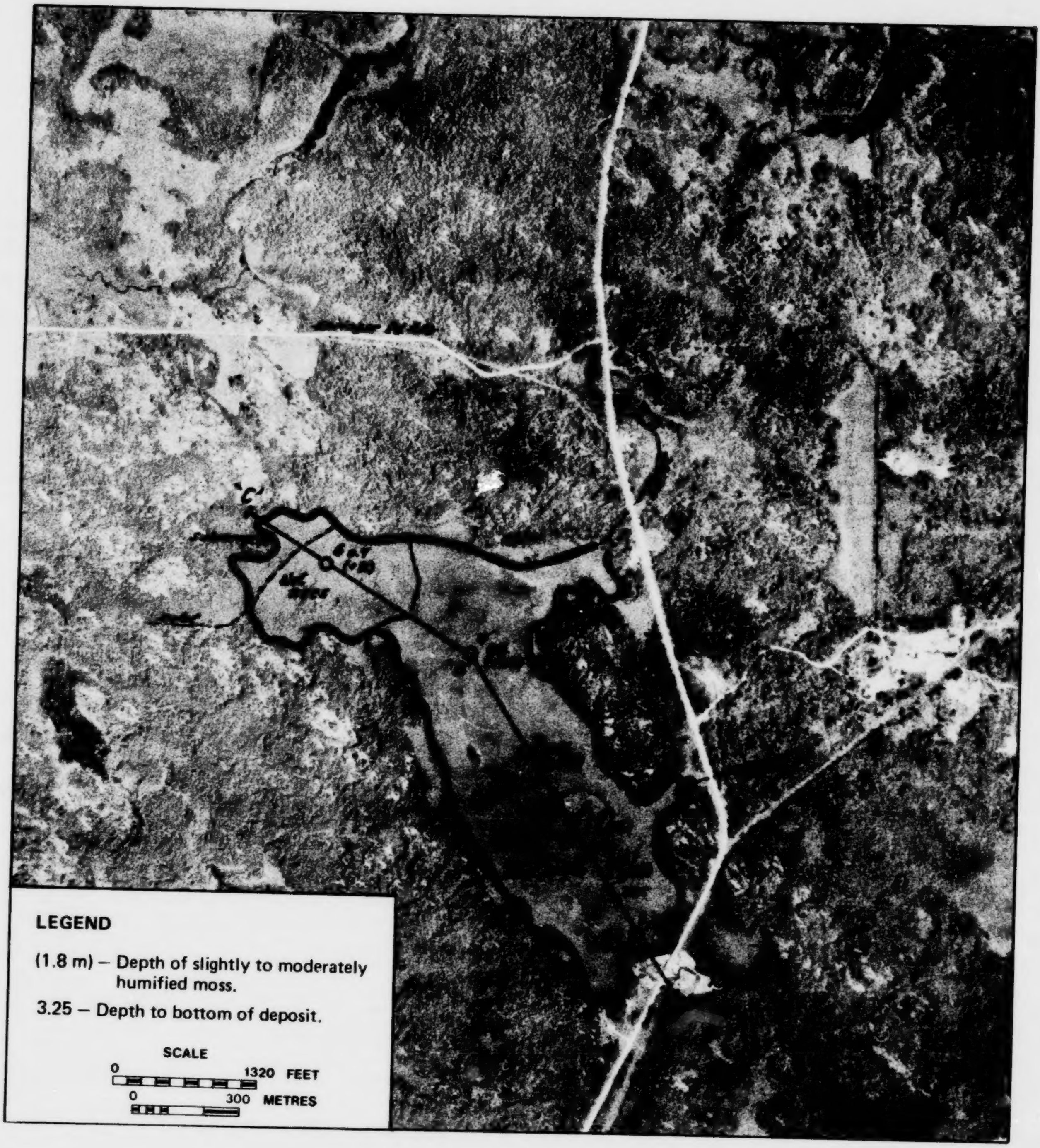

'C'
LEGEND
(1.8 m) – Depth of slightly to moderately humified moss.
3.25 – Depth to bottom of deposit.
SCALE
0
1320 FEET
0
300 METRES

Photo 12–Air photograph, Deposit 1: Springer Township

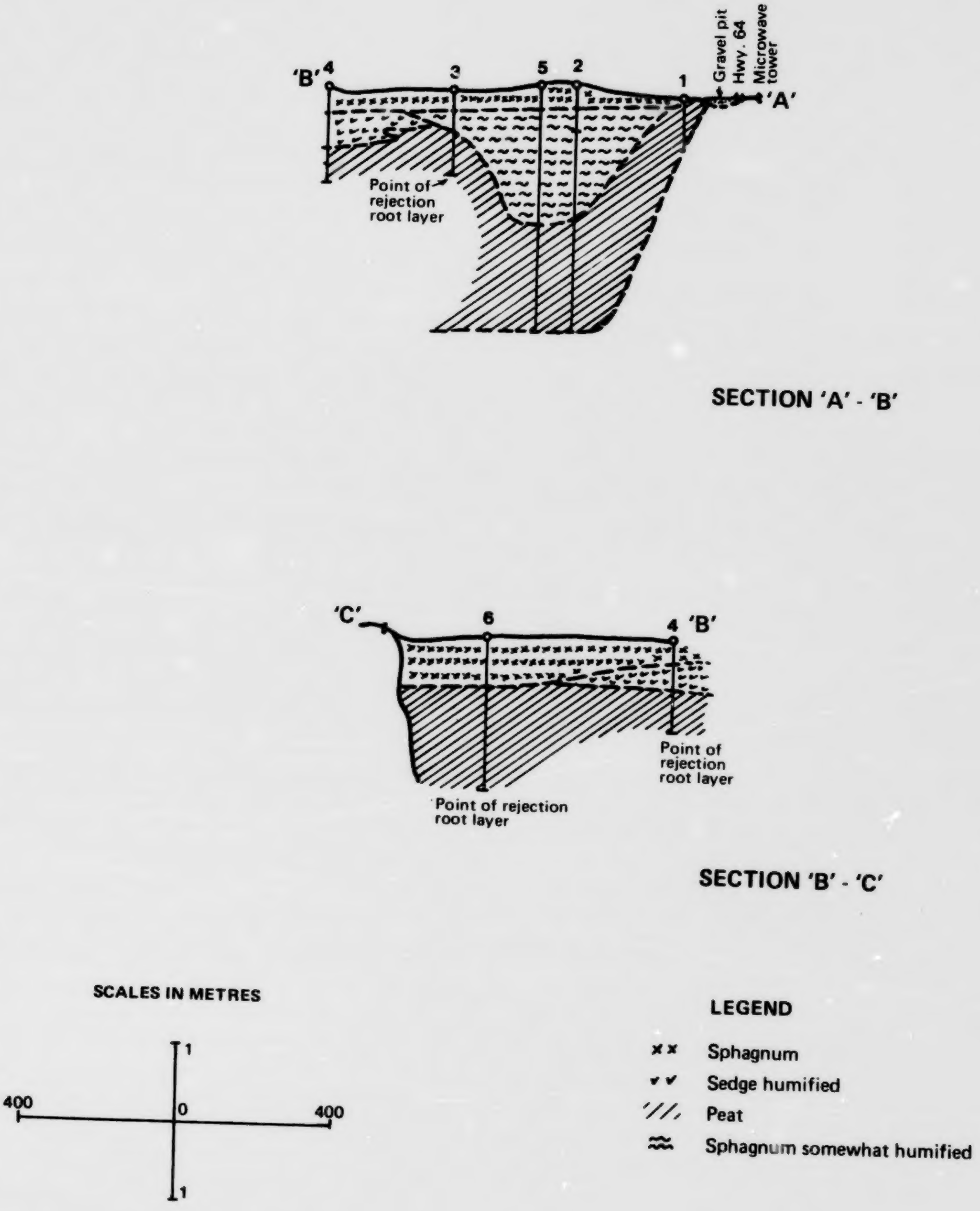

'B'
4
3
5
2
1
Gravel pit
Hwy. 64
Microwave tower
'A'
Point of rejection root layer
SECTION 'A' - 'B'
'C'
6
4
'B'
Point of rejection root layer
Point of rejection root layer
SECTION 'B' - 'C'
SCALES IN METRES
1
400
0
400
1
LEGEND
×× Sphagnum
✓✓ Sedge humified
/// Peat
≈ Sphagnum somewhat humified

Figure 4–Cross sections, locations shown on Photo 12. Deposit 1: Springer Township. (December 1975).

DEPOSIT 2: LOUDON TOWNSHIP

Location

This deposit is centred 1.6 km east and 2.4 km south of the northwest corner of Loudon Township. The village of St. Charles lies 14.5 km to the northwest. Sudbury lies 56 km to the northwest.

Access

Highway 64 passes by the bog 800 m to the west and north. Highway 16 and the Canadian Pacific Railway lie 20.4 km due north.

The bog can be reached by walking overland from the gravel pit visible on the air photograph 200 m east of Highway 64.

Area

This is a circular bog about 1 067 m in diameter occupying a depression in concentrically folded Grenville gneiss. The open area occupies approximately 140 ha.

Surface

The Loudon deposit has a hummocky surface which slopes gently to the south. Two outcrop areas of 2.7 and 1.4 ha lie in the central part of the bog.

Peripherally the deposit is wet and the outlet at the southeast end is inundated. There is abundant reed growth around the edges. The surface moss consists of sphagnum with some polytrichum areas. The overgrowth consists of eriophorum, labrador tea, and leather leaf.

The tree cover consists of scattered spruce and tamarack. Much of this tree growth has been water killed. The trees average 5 to 12.5 cm in diameter at the stump and about 6 m in height.

Depth

The depth of the bog varies from 1.5 to 2 m and rests on a grey plastic clayey silt bottom, except at sample site 5 where the peat rests directly on bedrock.

Nature of Peat

The uppermost 0.3 to 1 m consists of relatively unhumified grass, reed, and sedge with minor sphagnum. This in turn is underlain by 0.3 to 1.6 m of peat. Within the peat are a few lenses of moderately humified grass, reed, and sedge peat from 0.1 to 0.6 m thick. The west side of the deposit has a basal layer of fairly well preserved grass, reed, and sedge, 0.25 m thick. The basal layer is also present along the east side but is discontinuous. Beneath the surface layer the deposit contains 89.5 to 92.3 percent moisture and at sites 4, 5, and 6 the ash averages 5.6 percent on a dry basis.

Drainage

A creek flows into the west-central part and a creek flows out from the southeast end into the west arm of Lake Nipissing.

Comments

The relatively unhumified material in the Loudon deposit is not thick enough to be of economic interest under present conditions. In addition, the admixed sedge and reed would result in a dusty product of doubtful value.

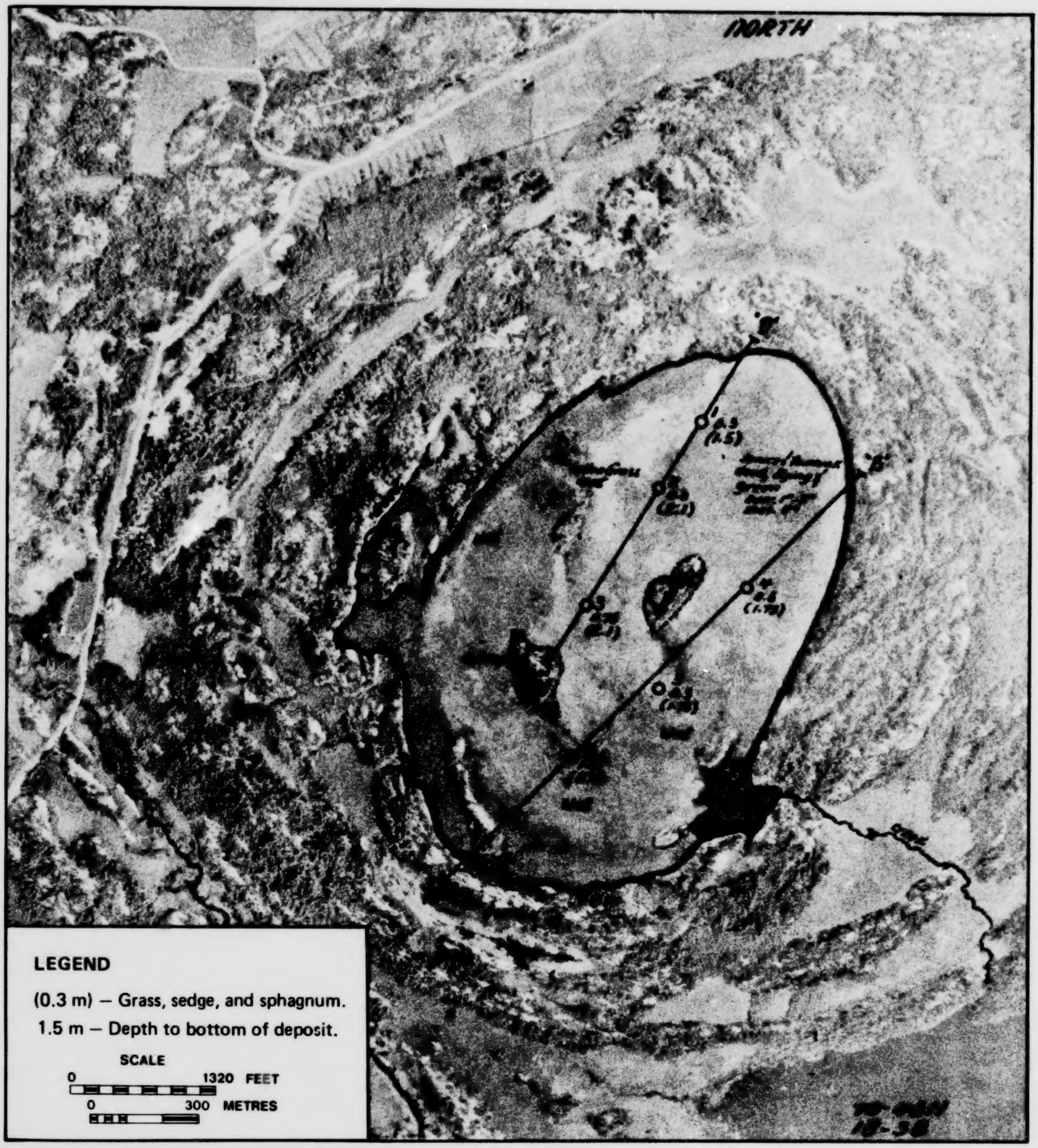
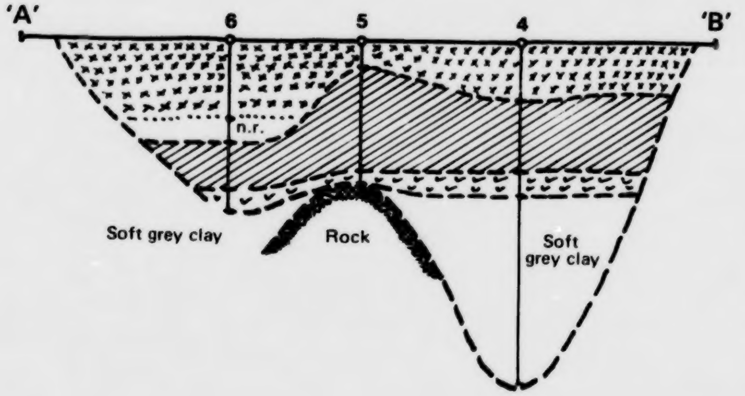
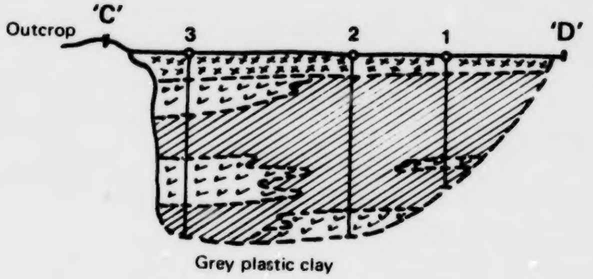

NORTH
"B"
1
0.3
(1.5)
(2.1)
4
0.6
(1.75)
LEGEND
(0.3 m) – Grass, sedge, and sphagnum.
1.5 m – Depth to bottom of deposit.
SCALE
0
1320 FEET
0
300 METRES

Photo 13–Air photograph, Deposit 2: Loudon Township

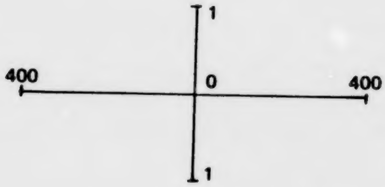

'A'
6
5
4
'B'
n.r.
Soft grey clay
Rock
Soft grey clay

SECTION 'A' - 'B'


Outcrop
'C'
3
2
1
'D'
Grey plastic clay

SECTION 'C' - 'D'

SCALES IN METRES



LEGEND

✓✓	Moderately humified sedge
///	Peat
××	Grass, sedge, sphagnum
n.r.	No recovery

Figure 5–Cross sections, locations shown on Photo 13. Deposit 2: Loudon Township. (December 1975).

DEPOSIT 3: STREET TOWNSHIP

Location

This deposit is centred 3.2 km west and 2 km north of the southeast corner of Street Township. Sudbury lies 25.7 km to the southwest.

Access

The Kukagmai Lake road leads north from Highway 17, 1.6 km west of Callum and passes 0.8 km west of the open area in the bog. A north-trending gravel road also passes 1.6 km to the east. The nearest rail siding is on the Canadian Pacific Railway at Stinson on Highway 17, 7.2 km to the southwest. A minimum of 1.6 km of road construction would be required to provide access to the bog.

Area

The open area extends 1.2 km in an easterly direction, averages 0.4 km in width, and comprises approximately 48 ha.

Surface

This bog occupies a depression surrounded by outcrops of biotite-feldspar-quartz paragneiss and garnetiferous migmatite.

The overgrowth consists of leather leaf, low bush cranberry, and dense 0.3 to 0.4 m high labrador tea and grass. A 2 to 4 cm layer of sphagnum supports this growth along with sparse scattered tamarack trees up to 3 m high. These trees average 6 cm in diameter at the stump. The eastern end is nearly devoid of trees. The northwest arm is wet with a growth of bullrushes.

Depth

The depth of this deposit varies from 1.3 to 2.8 m. The deposit rests on a clay bottom.

Nature of Peat

Between sites 1 and 3 there is from 0.75 to 1.3 m of brown medium-textured sphagnum of commercial quality. This material has an absorptive value of 12 and a wet volume dry weight of 0.06 gm/cc. The ash content of 7.1 to 8.2 percent indicates more foreign material present than was observed.

At site 1, there is a second layer of sphagnum 0.3 m thick separated from the upper layer by 0.25 m of humified sphagnum. This layer was not encountered at the other sample sites.

The moisture content at the sites sampled varies from 86.2 to 92.9 percent and averages 89.5 percent.

Drainage

A stream flows into the northwest arm of the bog. A beaver dam at the entrance of the creek has flooded the area to the west. A second stream flows from the north into the north-central part and it too is damned by beavers. The stream from the west flows easterly along the northern part of the bog and the inlet from the north joins it. At the point of junction the bog is very wet.

The outlet of the bog is at the west end where it drains into a lake 400 m east of the open area.

Comments

At site 3 there is a sufficient thickness of horticultural grade sphagnum to meet production requirements. This appears to thin out laterally and the specific limits would require detailed sampling. The area of interest appears to be limited, possibly about 4 ha.

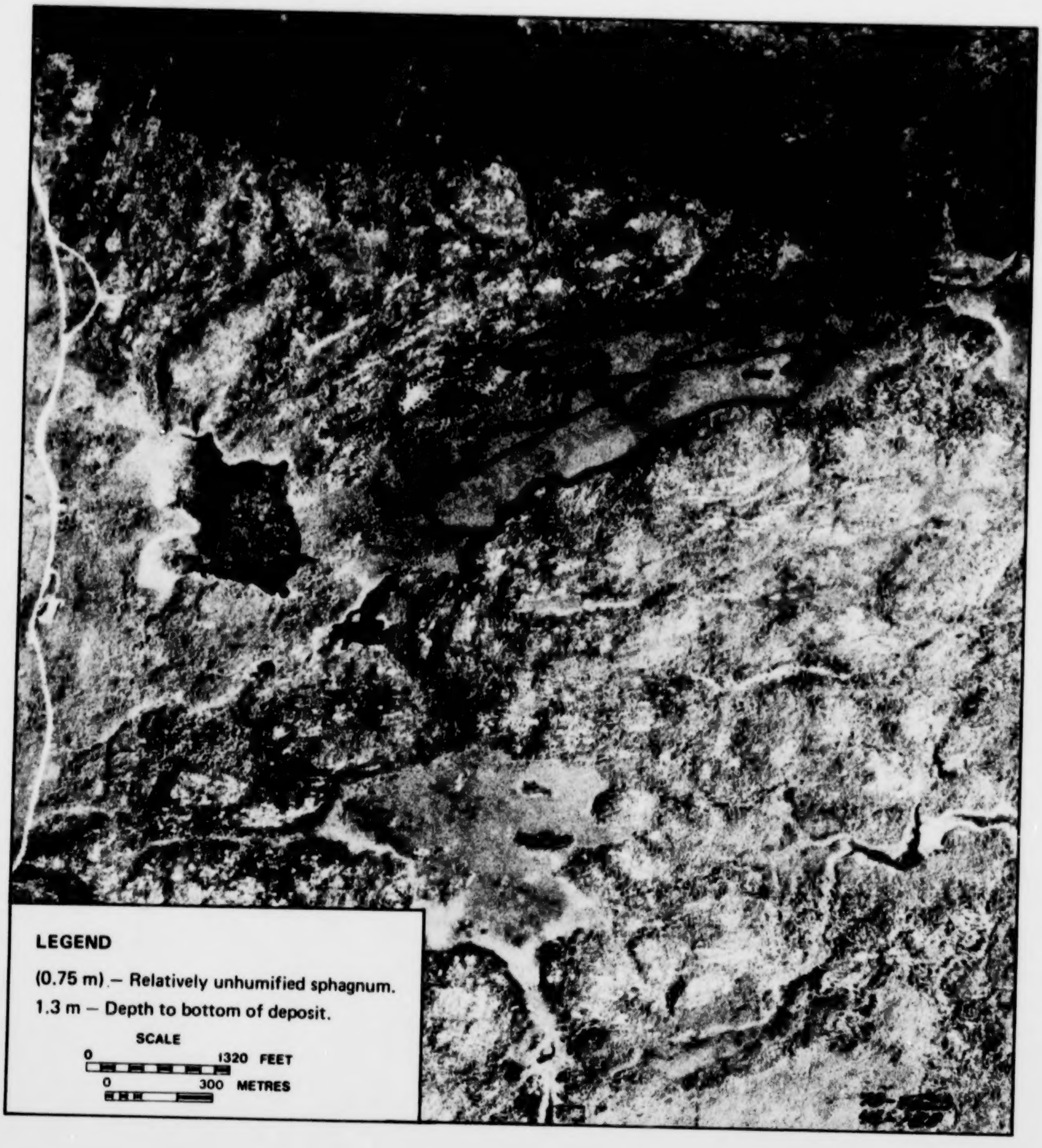
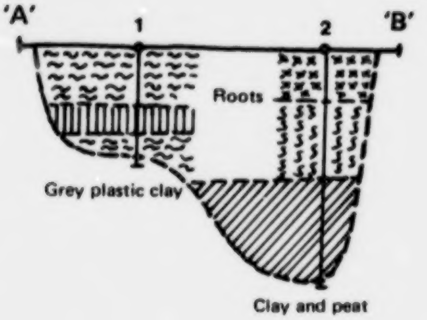
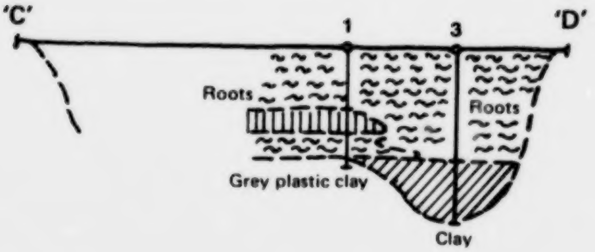

LEGEND
(0.75 m) – Relatively unhumified sphagnum.
1.3 m – Depth to bottom of deposit.
SCALE
0
1320 FEET
0
300 METRES

Photo 14–Air photograph, Deposit 3: Street Township

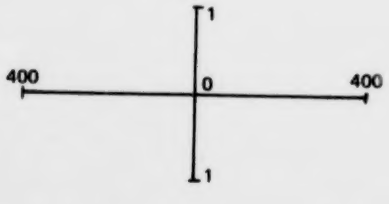

'A'
1
2
'B'
Roots
Grey plastic clay
Clay and peat

SECTION 'A' - 'B'


'C'
1
3
'D'
Roots
Roots
Grey plastic clay
Clay

SECTION 'C' - 'D'

SCALES IN METRES



LEGEND

≈≈	Relatively unhumified sphagnum
||||	Humified sphagnum
///	Peat
××	Sedge slightly humified
SS	Sedge moderately humified

Figure 6–Cross sections, locations shown on Photo 14. Deposit 3: Street Township. (December 1975).

DEPOSIT 4: STREET TOWNSHIP

Location

This deposit is centred 8.4 km north and 2.4 km west of the southeast corner of Street Township. Sudbury lies 25.7 km to the southwest.

Access

A gravel road 1.6 km west of Callum leads north from Highway 17 and passes 490 m west of the west end of the open area. A trail passable by car leads east from this road to the north end of the bog for a distance of approximately I km. The Canadian National Railways passes by the south side of the bog.

Area

The long axis of the deposit trends in an easterly direction and has a length 2.2 km and an average width of approximately 460 m. The open area comprises about 74 ha.

Surface

The surface of the bog is firm and dry. It is covered by a dense growth of labrador tea, 0.3 to 0.5 m high with some eriophorum.

Scattered fire killed trees occur throughout. They are spaced from 2.4 to 6 m apart and average 3 to 5 cm in diameter at the stump.

The green surface layer of moss consists of 0.1 to 0.2 m of polytrichum except at site 5 where sphagnum is present.

This deposit has a slight dome or crown in the central part, elongated in the direction of the long axis.

Depth

The deposit has a depth from 2.25 to 2.74 m and rests on a sandy clay bottom.

Nature of Peat

The sampling indicates that the slight dome or crown in the central part of the bog contains about 0.76 m of somewhat humified sedge succeeded by a 0.15 m layer of slightly to moderately humified sphagnum.

Elsewhere the green surface moss is underlain by peat.

At sample sites 4 and 5 the moisture content of the peat in place varies from 87.3 to 90.4 percent and averages 89.9 percent. The ash content averages 3.4 percent.

The numerous roots present make sampling difficult. The peat lies on a clay bottom which locally is admixed with some peat. At site 3 the density of compacted peat at a depth of 2.74 m prevented further penetration.

Drainage

A creek flows into the bog from the west end. At the time of examination the flow was about I 300 litres per minute. A second creek flows into the bog from the north near the east end and exits 460 m farther east where it turns south and drains into the Wanapitei River. The outflow is clear, probably due to the limited extent the creek flows through the bog. It would appear that the volume of water flowing out of this deposit is less than that flowing in. The water table in the vicinity of the outlet at site 5 is 0.6 m below the surface.

Comments

Sample sites 2 and 3 indicate an area of about 14.7 ha of relatively unhumified material with a depth of 0.91 m. The upper 0.76 m is composed mainly of sedge which would produce a heavy dusty product. The remaining 0.15 m is mainly sphagnum. Consequently the bulk of this material is of questionable quality under present requirements.

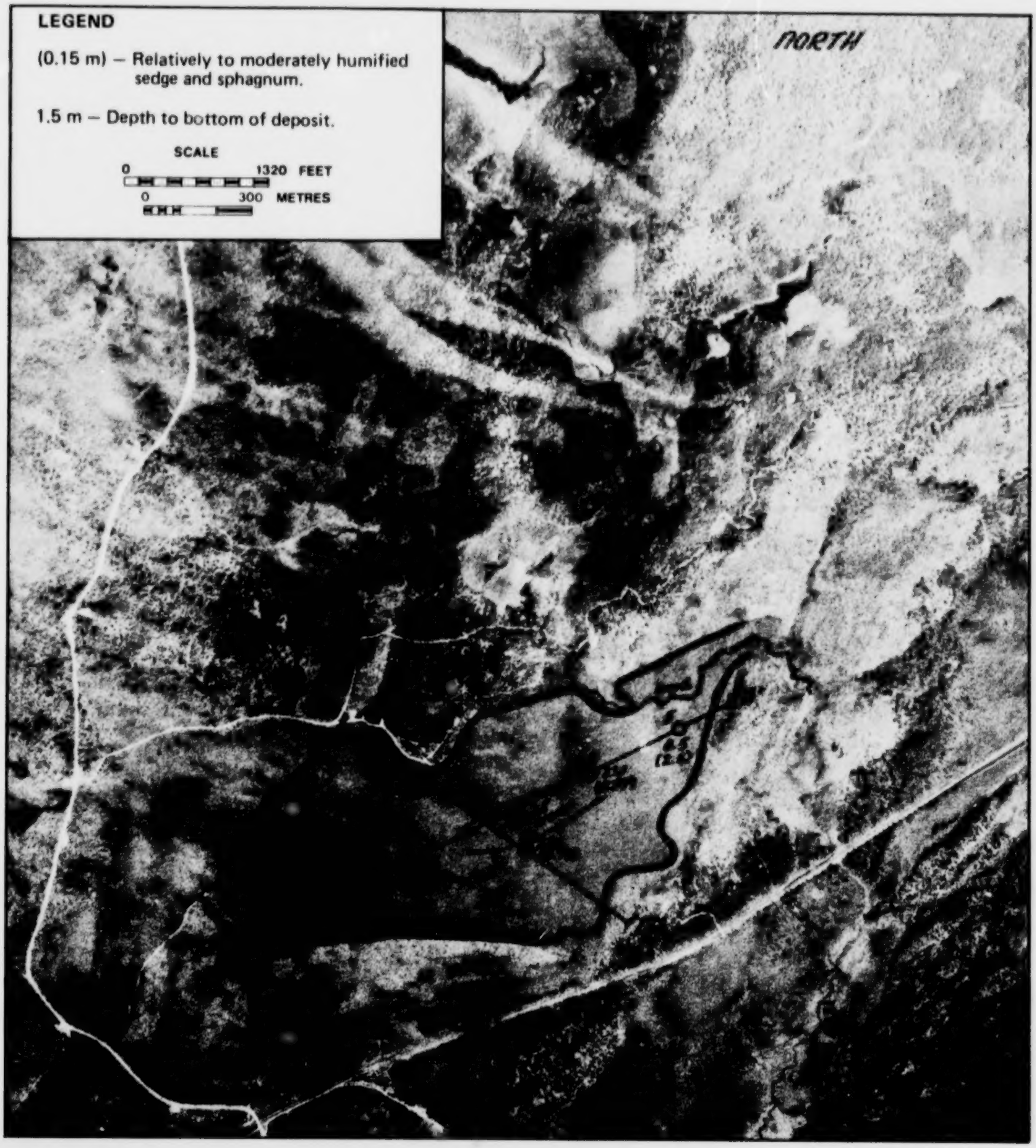
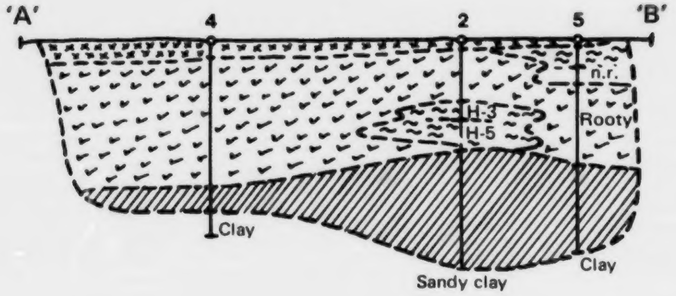
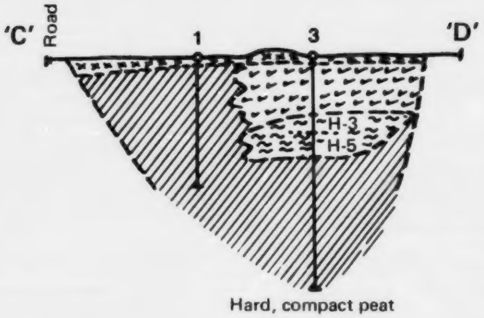

LEGEND
(0.15 m) – Relatively to moderately humified sedge and sphagnum.
1.5 m – Depth to bottom of deposit.
SCALE
0
1320 FEET
0
300 METRES
NORTH

Photo 15–Air photograph, Deposit 4: Street Township

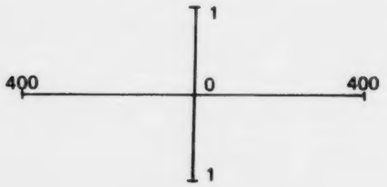

'A'
4
2
5
'B'
n.r.
H-3
H-5
Rooty
Clay
Sandy clay
Clay

SECTION 'A' - 'B'


'C'
Road
1
3
'D'
H-3
H-5
Hard, compact peat

SECTION 'C' - 'D'

SCALES IN METRES



LEGEND

××	Green polytrichum
✓✓	Sedge and reeds
///.	Peat
n.r.	No recovery
≈	Sphagnum
H3	Humification von Post Scale

Figure 7–Cross sections, locations shown on Photo 15, Deposit 4: Street Township. (December 1975).

DEPOSIT 5: CAPREOL TOWNSHIP

Location

This deposit is centred 8 km south and 2 km west of the northeast corner of the township. Sudbury lies 14.5 km to the south.

Access

Paved Highway 545 passes along the southern margin of the bog at the west end. This road connects with the city of Sudbury. The Sudbury airport lies 2 km to the east.

Area

The open area consists of about 219 ha. It has a maximum length of 3.2 km and a maximum width of 2.4 km.

Surface

This deposit has a dense growth of alders 150 m wide extending in an east-west direction across the centre of the bog. It follows the course of the creek flowing westerly through the bog. The surface of the bog dips gently towards the alder growth both from the north and from the south.The western half of the bog was wet at the time of examination.

The surface growth consists of polytrichum and 0.3 to 0.4 m of sphagnum with leather leaf, leafy liverwort, eriophorum, and labrador tea, the latter averaging 0.4 m in height.

Water-killed trees averaging about 3 m in height and 3 to 4 cm in diameter at the stump are scattered throughout the southern part of the bog. The northern part has fewer trees.

Depth

At sites 4 and 5, in the east-central part, the depth is 0.7 to 2 m and the peat rests on clay. Elsewhere depths of 0.7 to 1.52 m were reached but numerous roots prevented further penetration.

Nature of Peat

Peat underlies the 0.06 to 0.2 m thick surface layer of green moss. Many roots are present throughout. The moisture content of the peat varies from 83.8 to 85.8 percent and averages 87.5 percent whereas the ash averages 5.5 percent including one anomalous value of 22 percent.

Drainage

Drainage into the bog is from the northeast and east ends. A ditch drains the bog to the southwest from the southwest end.

Comments

There is not sufficient horticultural grade peat moss to be of interest in this deposit.

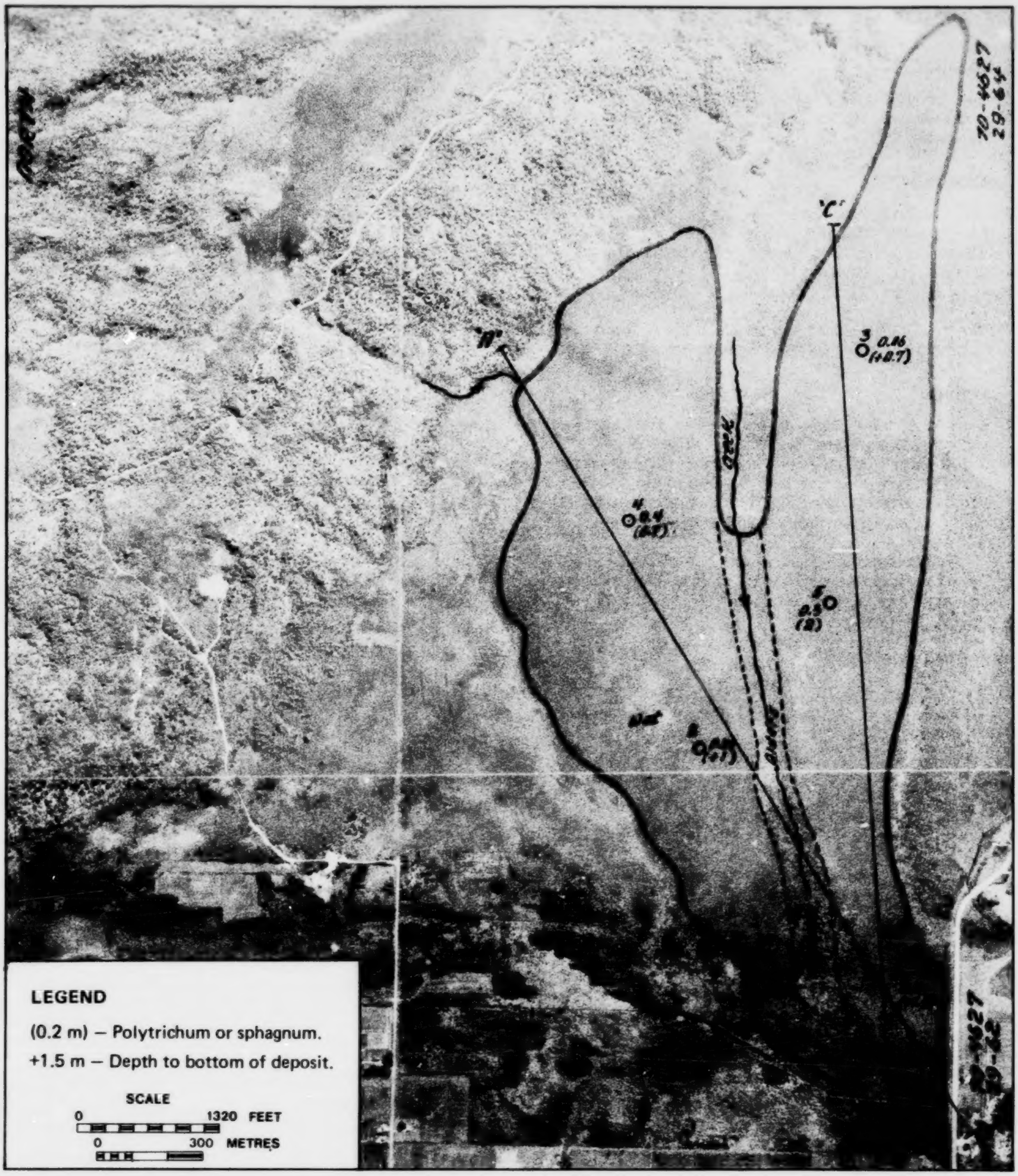
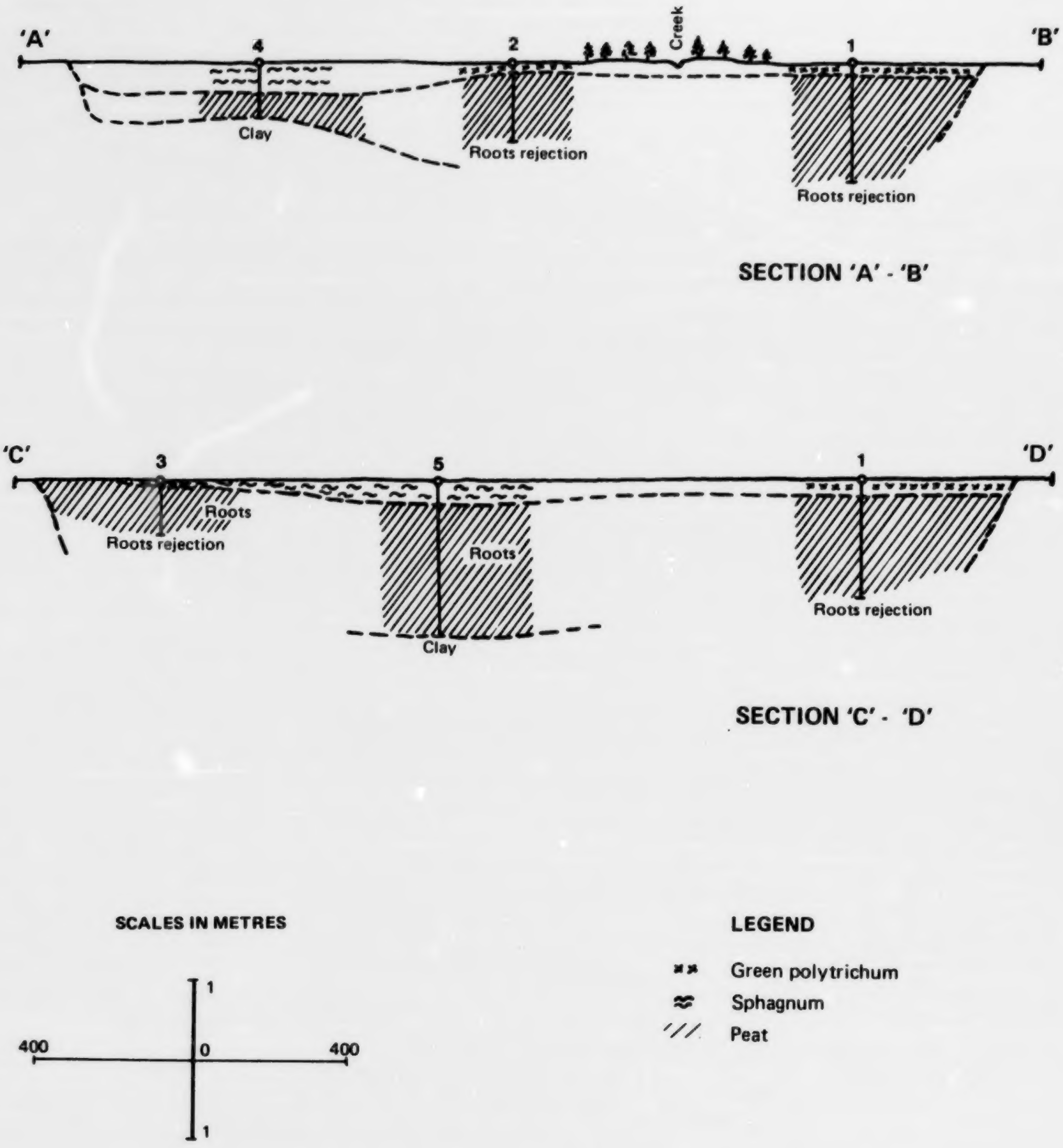

'A'
'C'
70-4627
29-64
3 0.16 (+0.7)
4 0.4
5 0.5 (2)
Creek
Drain
Wet
70-4627
30-22
LEGEND
(0.2 m) – Polytrichum or sphagnum.
+1.5 m – Depth to bottom of deposit.
SCALE
0
1320 FEET
0
300 METRES

Photo 16–Air photograph, Deposit 5: Capreol Township


'A'
4
2
Creek
1
'B'
Clay
Roots rejection
Roots rejection
'C'
3
5
1
'D'
Roots
Roots rejection
Roots
Roots rejection
Clay
SCALES IN METRES
1
400
0
400
1
LEGEND
Green polytrichum
Sphagnum
Peat

SECTION 'A' - 'B'

SECTION 'C' - 'D'

Figure 8–Cross sections, locations shown on Photo 16. Deposit 5: Capreol Township, (December 1975).

DEPOSIT 6: CAPREOL TOWNSHIP

Location

This deposit is centred 5.47 km south and 3.62 km east of the northwest corner of Capreol Township. Sudbury lies 24 km to the south and the airport 7.64 km to the southeast.

Access

The north-central part of the bog is accessible from the west by a gravel road which connects with Highway 69. Highway 69 joins with Highway 545 about 3.2 km to the south. A north-south gravel road lies a short distance east of the east side of the bog. An east-west road crosses through the southern part 820 m south of the open area. The nearest siding is on the Canadian National Railways and lies 2 km to the west. A north-south power line crosses the southwestern and western parts of the bog.

Area

The bog extends 4.42 km in a northeast direction and is about 800 m wide. At the northern end is an open area comprising about 92 ha.

Surface

The open area extends south from Moose Lake. The shore of Moose Lake in the vicinity of the bog is a cobble beach and the basin of the lake is clay indicating the north limit of the bog to be the south shore of Moose Lake.

The open portion slopes gently upward toward the south. The northern end is firm and dry but becomes progressively wetter towards the south.

The surface is relatively even underfoot. Sparsely scattered dead trees 2 to 4 cm in diameter at the stump occur in the northern part. The southern half is relatively free of trees.

Labrador tea and grass grow on a mossy surface which varies from sphagnum in the northern and central parts to polytrichum admixed with some sphagnum in the southern part.

Charred roots encountered in sampling indicate that the bog has been burned at some time in the past.

Depth

At site 1 a thickness of 3.04 m of peat rests on a grey clay bottom. Elsewhere bottom could not be reached because of numerous roots.

Nature of Peat

The green surface layer of moss extends to depths of 0.1 to 0.3 m. Underlying this is irregularly interbedded sedge and sphagnum humified to varying degrees. The moisture content of two samples is 89.4 and 70.9 percent and the ash 10.6 and 4.0 percent.

The least humified area is at site 1. Here there is a depth of 2.74 m of sedge and sphagnum that is of commercial quality although the sedge content would render a dusty product.

Drainage

Elevations would be required to determine if Moose Lake would prevent the water-table being lowered sufficiently to allow harvesting. This lake is 1.4 km long and could cause a drainage problem.

Comments

Additional sampling would be required to determine specifically the area of horticultural grade material of sufficient depth to be commercially interesting. Halfway between sites 1 and 3 and 1 and 2 there is an area of 12.7 ha which would contain horticultural material.

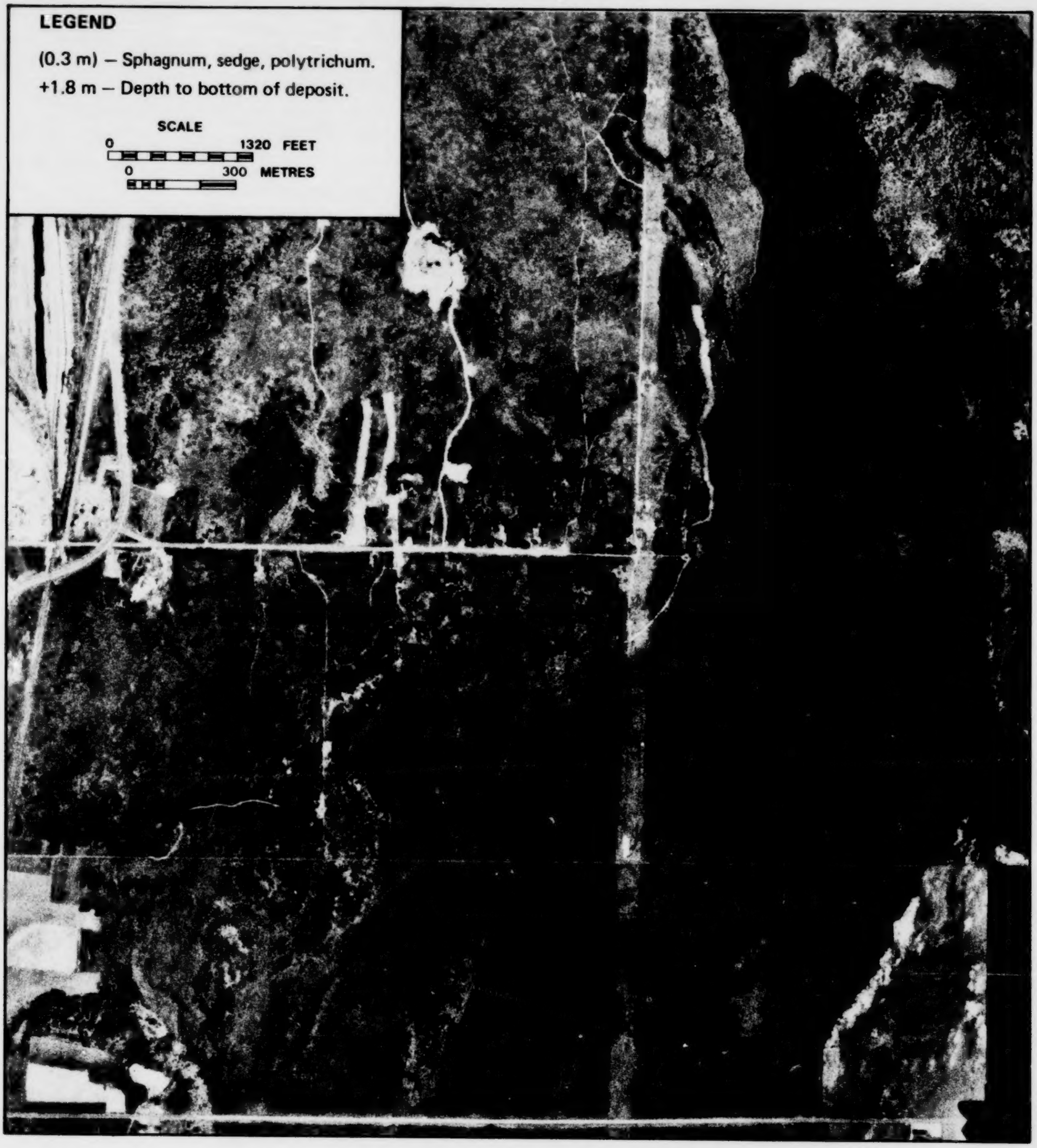

LEGEND
(0.3 m) – Sphagnum, sedge, polytrichum.
+1.8 m – Depth to bottom of deposit.
SCALE
0
1320 FEET
0
300 METRES

Photo 17–Air photograph, Deposit 6: Capreol Township

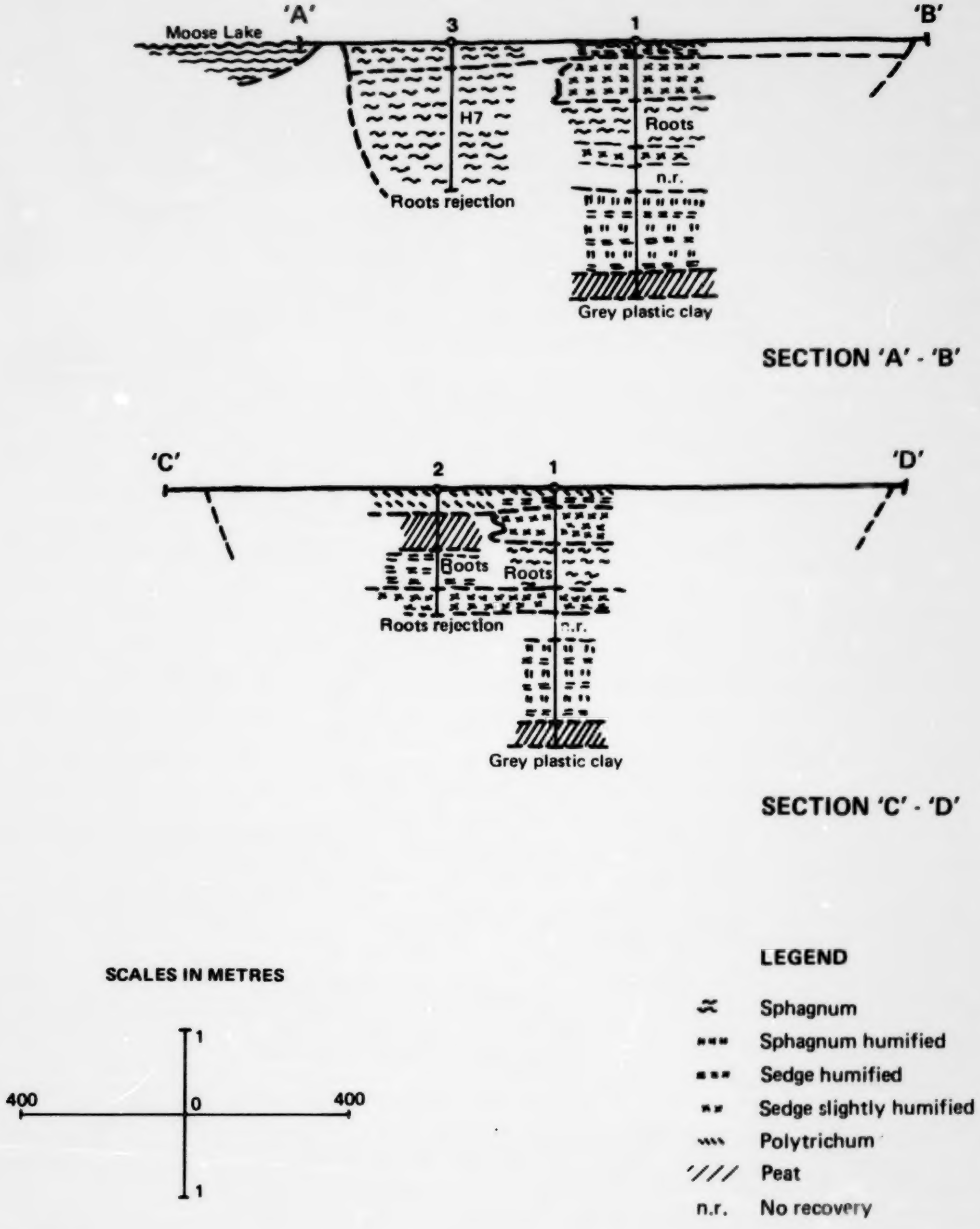

'A'
Moose Lake
3
1
'B'
H7
Roots
n.r.
Roots rejection
Grey plastic clay
SECTION 'A' - 'B'
'C'
2
1
'D'
Roots
Roots
Roots rejection
n.r.
Grey plastic clay
SECTION 'C' - 'D'
SCALES IN METRES
1
400
0
400
1
LEGEND
Sphagnum
Sphagnum humified
Sedge humified
Sedge slightly humified
Polytrichum
Peat
n.r. No recovery

Figure 9–Cross sections, locations shown on Photo 17. Deposit 6: Capreol Township. (December 1975).

DEPOSIT 7: HALLAM TOWNSHIP

Location

This deposit is centred 800 m west and 5.6 km north of the southeast corner of the township. Espanola lies 4.8 km to the east.

Access

A gravel highway leading west from Espanola passes along the bog 400 m to the north. The Canadian Pacific Railway lies 4 km to the north.

Area

The open part is irregular. The long axis strikes east and the open part has a maximum length of 2.28 km. The average width is about 460 m. The open area consists of approximately 116 ha.

Surface

This bog slopes gently down to the west. The southern and western parts are free of trees. An island of spruce, 1 km long and 150 m wide, occupies the northeastern part. East of this treed area are stunted tamaracks 1 to 1.3 m high and averaging 4.5 m apart. The remaining bog is free of trees. The surface is covered by green sphagnum supporting a growth of grass and reeds. The surface is slightly wet underfoot.

Depth

The southern part of this deposit is quite shallow attaining depths of from 0.3 to 0.6 m. It becomes progressively deeper to the north. Depths of 3 to 3.9 m were obtained near the northern edge and 4.25 m at the northeastern end.

Nature of Peat

The surface layer of green sphagnum varies in depth from 0.15 to 0.3 m. The thinner parts occur in the southern part. In the vicinity of the treed area in the northeastern part of the bog and extending to the west the green surface layer is underlain by 0.7 to 2.7 m of slightly humified sedge which either rests directly on a sand bottom, peat, or humified sedge. East of the treed area the surface layer is underlain by 2.2 m of humified sphagnum which in turn is underlain by 1.6 m of relatively unhumified sphagnum admixed with grass. At site 5 the moisture content varies from 93.2 to 96.0 percent and the ash from 4.1 to 5.6 percent. The green surface moss has an anomalously high ash content of 20.2 percent in view of the high water absorption capacity and low volume weight of 0.06 gm/cc.

Drainage

Natural drainage is to the west via a creek that drains into the LaCloche River. This creek has been extended north to the road by a ditch. The east end has been ditched to the north and drains into the river.

Comments

Whereas this bog requires little clearing and the drainage does not represent a problem and access is convenient, the nature of the material does not conform to current requirements.

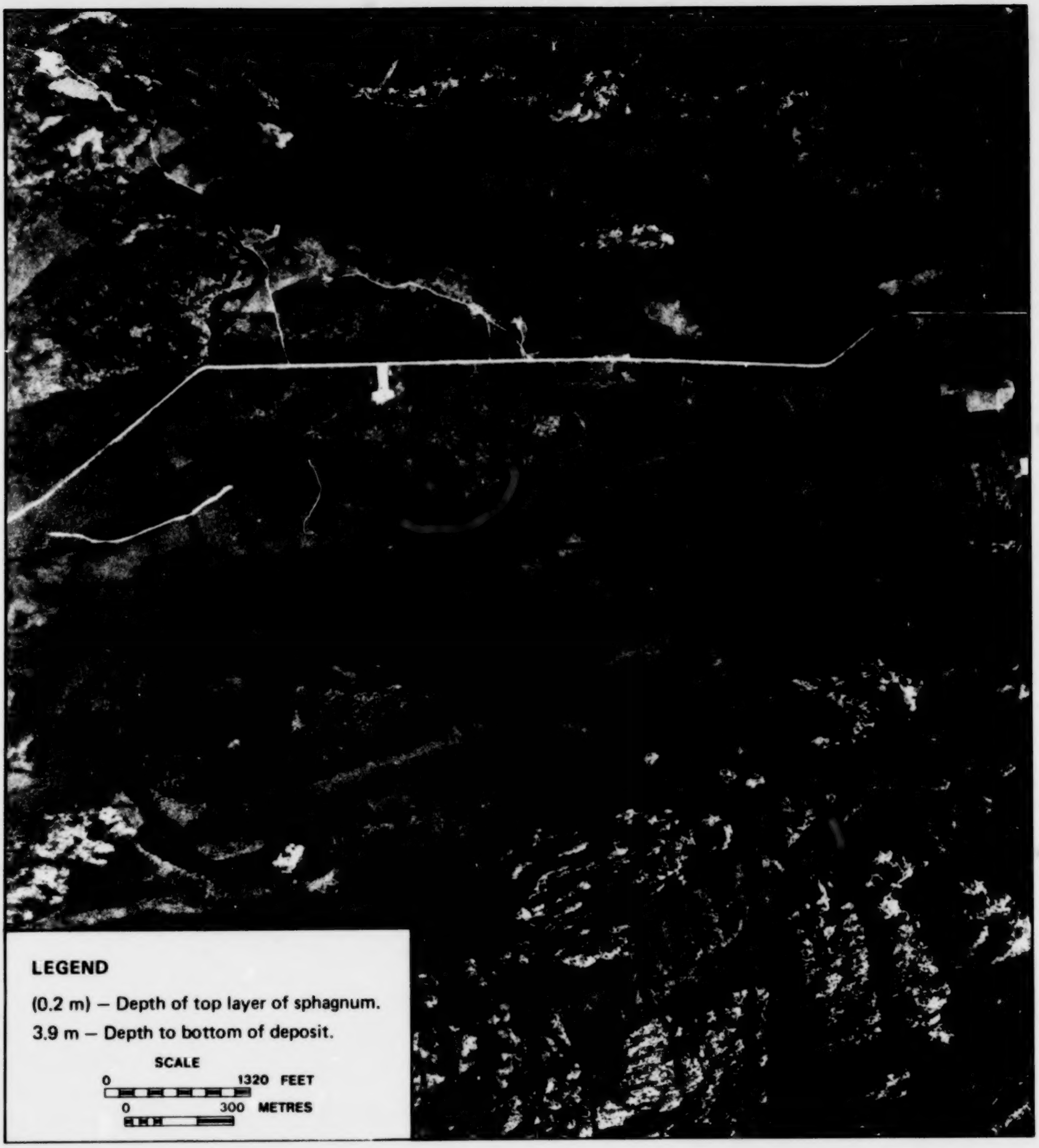

LEGEND
(0.2 m) – Depth of top layer of sphagnum.
3.9 m – Depth to bottom of deposit.
SCALE
0
1320 FEET
0
300 METRES

Photo 18–Air photograph, Deposit 7: Hallam Township

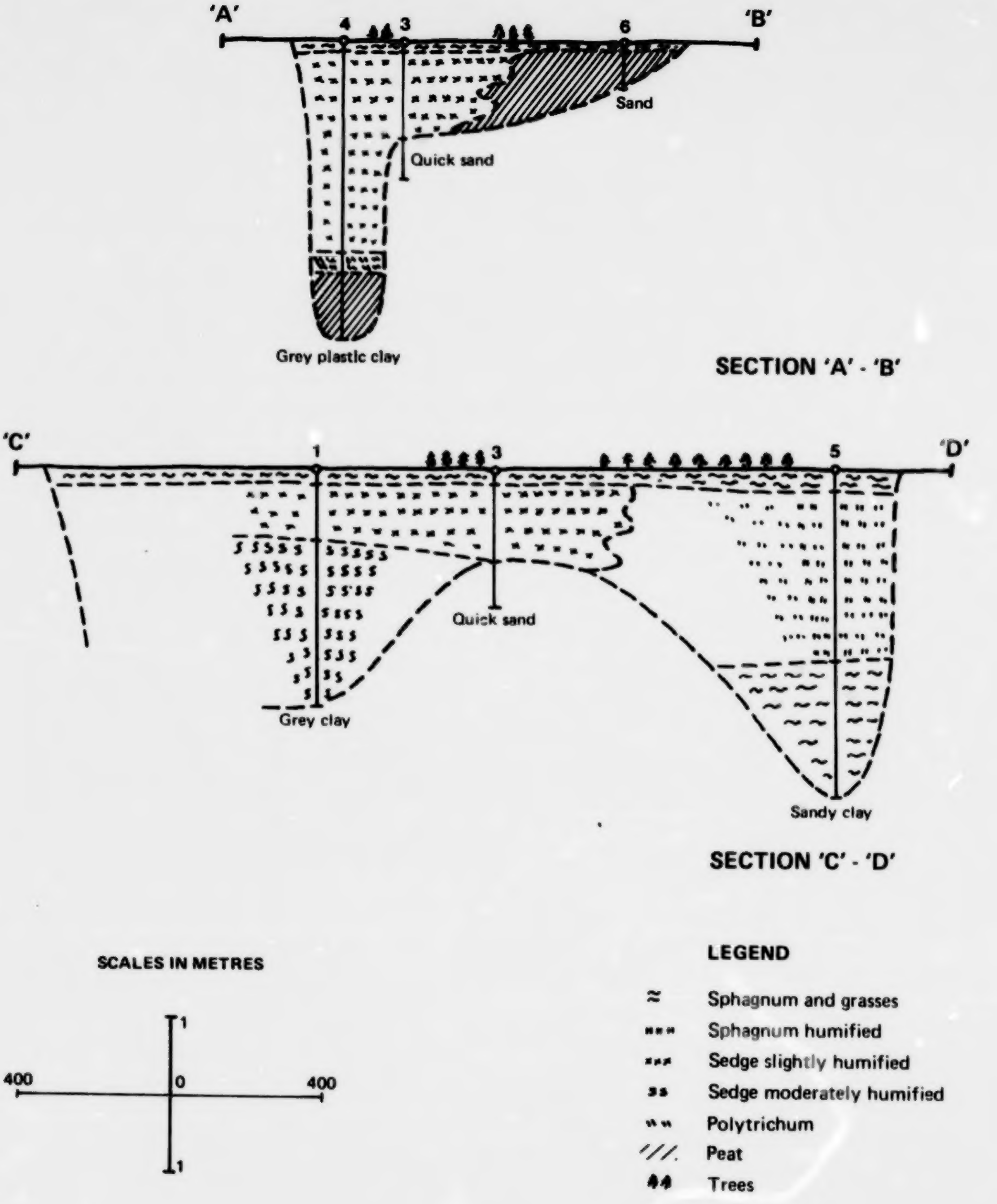

'A'
4
3
6
'B'
Sand
Quick sand
Grey plastic clay
SECTION 'A' - 'B'
'C'
1
3
5
'D'
Quick sand
Grey clay
Sandy clay
SECTION 'C' - 'D'
SCALES IN METRES
1
400
0
400
1
LEGEND
Sphagnum and grasses
Sphagnum humified
Sedge slightly humified
Sedge moderately humified
Polytrichum
Peat
Trees

Figure 10–Cross sections, locations shown on Photo 18, Deposit 7: Hallam Township. (December 1975).

DEPOSIT 8: GALBRAITH TOWNSHIP

Location

This deposit is centred 3.8 km north and 5.1 km east of the southwest corner of the township. Sault Ste. Marie lies 48.2 km to the west.

Access

The bog may be reached by taking the secondary road leading west from Dunn's Valley for 1.6 km. At this point the road passes along the south side of the bog. Highway 17 and the Canadian Pacific Railway lie 19.7 km to the south.

Area

The deposit is roughly circular in outline and is approximately 1 km in diameter. It comprises an area of 85.6 ha. Rocky ridges form the north boundary.

Surface

The surface slopes gently inwards from the northeastern and southwestern parts towards a creek which flows southeast through the bog. The northwestern and extreme eastern parts are relatively devoid of trees. The central part and the area bordering the creek is wooded. The trees are predominantly spruce, are up to 9 m in height, and average 10 cm in diameter at the stump. This tree growth is supported on a surface layer of green sphagnum and hummocks of labrador tea up to 0.9 m in height. In the open areas, grass, low bush cranberry, and labrador tea grow on the sphagnum. Moss hummocks are also present averaging 0.45 m in height.

Depth

The reconnaissance sampling indicates the depth of this deposit varies from 4.5 to 6 m. The deposit rests on a light grey-blue to grey, clay bottom. In the vicinity of sites 2 and 3 there has been some mixing of peat with the clay.

Nature of Peat

There is a top layer of 1 to 3 m of sphagnum of moderate commercial quality. The greatest depth of this material occurs at site 3, in the southeastern part adjacent to the creek and quite possibly extends over the southern half of this deposit. The absorption varies from 10.5 to 23.2; the moisture varies from 90.9 to 96 percent and averages 93.3 percent. The ash varies from 1.9 to 7 percent and averages 4.08 percent. The wet volume dry weight at site 3 averages 0.06 gm/cc .

The sphagnum layer is underlain by peat.

At site 1 is a 1 m bed of hypnum which was not located at sites 2 or 3 and consequently must be of relatively limited extent. Similarly at site 2, a 1.5 m bed of sphagnum underlies peat at a depth of 1.5 m. This too appears to have limited extent.

Drainage

A creek flows southeasterly through the southwestern part of the bog. At the influx, the flow is about 1800 litres per minute. For adequate drainage a peripheral ditch along the southwestern side should be required to divert this flow. It would then follow the road drainage east to the outlet which has been ditched southeast for 200 m to rejoin the natural drainage to the southeast into the Thessalon River.

Comments

The quality of the moss at site 3 is good. The thickness here is adequate for commercial production and could extend over an area of about 18 ha. Detailed sampling would be required to confirm this.

Clearing costs would be higher than normal because of the wooded nature of the deposit and because of these trees the root content in the bog would add to the production cost.

The potential area is rather limited to support a full-time operation but could be of value at some time in the future.

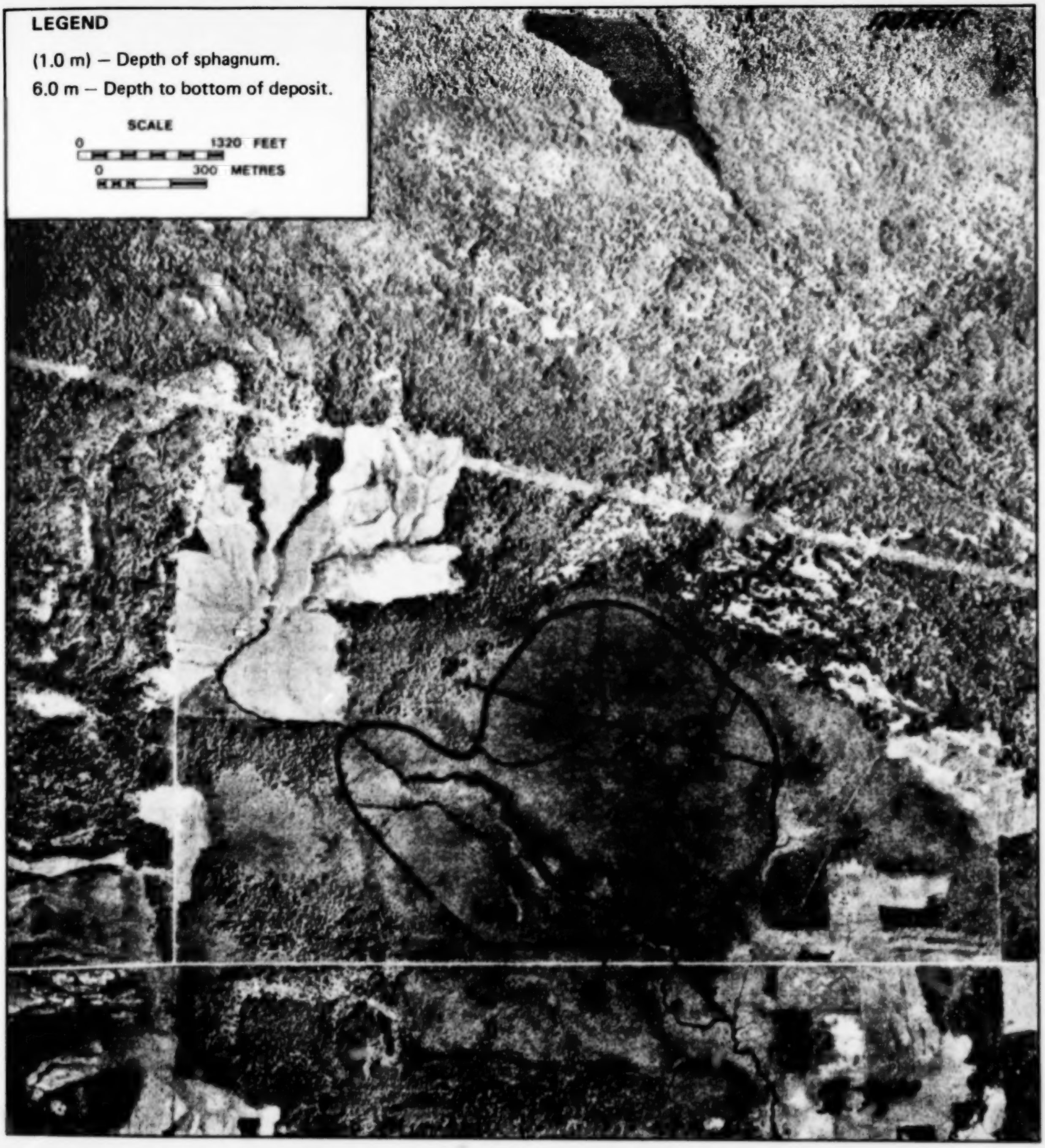

LEGEND
(1.0 m) – Depth of sphagnum.
6.0 m – Depth to bottom of deposit.
SCALE
0
1320 FEET
0
300 METRES

Photo 19–Air photograph, Deposit 8: Galbraith Township

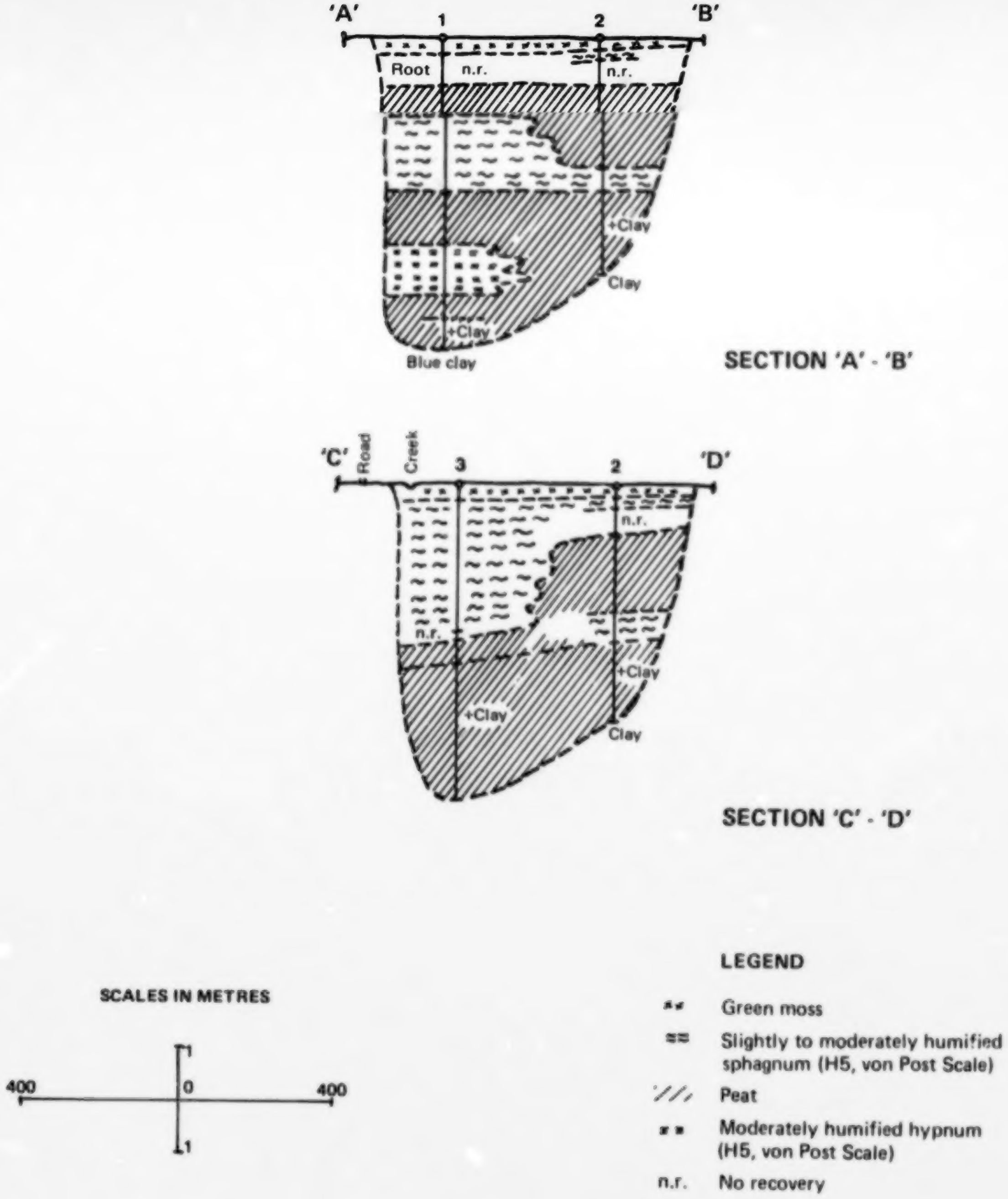

'A'
1
2
'B'
Root
n.r.
n.r.
+Clay
Clay
+Clay
Blue clay
SECTION 'A' - 'B'
'C'
Road
Creek
3
2
'D'
n.r.
n.r.
+Clay
+Clay
Clay
SECTION 'C' - 'D'
SCALES IN METRES
400
0
400
1
1
LEGEND
Green moss
Slightly to moderately humified sphagnum (H5, von Post Scale)
Peat
Moderately humified hypnum (H5, von Post Scale)
n.r. No recovery

Figure 11–Cross sections, locations shown on Photo 19. Deposit 8: Galbraith Township. (December 1975).

DEPOSIT 11: FENWICK TOWNSHIP

Location

This deposit is centred 400 m west and 1.6 km north of the southeast corner of the township. Sault Ste. Marie lies 19.3 km to the south.

Access

Access is from the settlement of Goulais River 0.8 km south of Highway 17. Goulais River lies 1.6 km west of the bog. A north-south gravel road passes along the eastern edge and a north-south transmission line passes along the western edge.

Area

The open part of this deposit extends 2 km in a north-south direction and 800 m in an east-west direction. The open area comprises approximately 125 ha.

Surface

This deposit occupies a depression in a sand plain. Beach strandlines are visible just west of the bog. The bog has a rather dense tree growth at the extreme southern end and in the northeastern part. Elsewhere there are scattered clumps of spruce, small birch, and willows occurring mainly in the north-central part. To the south of this, the bog is free of trees except at the extreme southern end. Clumps of labrador tea about 0.4 m in height occupy the northern half of the deposit whereas the southern part is characterized by grass. This growth is supported by hummocky green sphagnum, the hummocks averaging 0.3 m in height.

Depth

This deposit is shallow, varying from 0.5 to 0.75 m deep. It rests on a sandy bottom.

Nature of Peat

The thin surface layer of sphagnum varies from 0.2 to 0.3 m thick. It is admixed with herbaceous material. This is underlain by peat with a moisture content of 85 to 88.8 percent and averaging 86.1 percent. The higher than normal average ash content of 14.5 percent and wet volume dry weight of 0.18 gm/cc indicates a mineral-rich peat, probably due to its shallow depth.

Drainage

There is no apparent drainage into this deposit. The outlet is at the northern end. Here there is a creek which flows under the road and into the Goulais River which is approximately 7 to 8 m below the surface of the bog. The creek has been dammed by beavers just north of the road and there is very little flow of water over the dam. The moisture content of 85 to 88.8 percent indicates that drainage is fairly well advanced.

Comments

There is insufficient depth of sphagnum moss suitable for horticultural purposes to be of economic interest at this time.

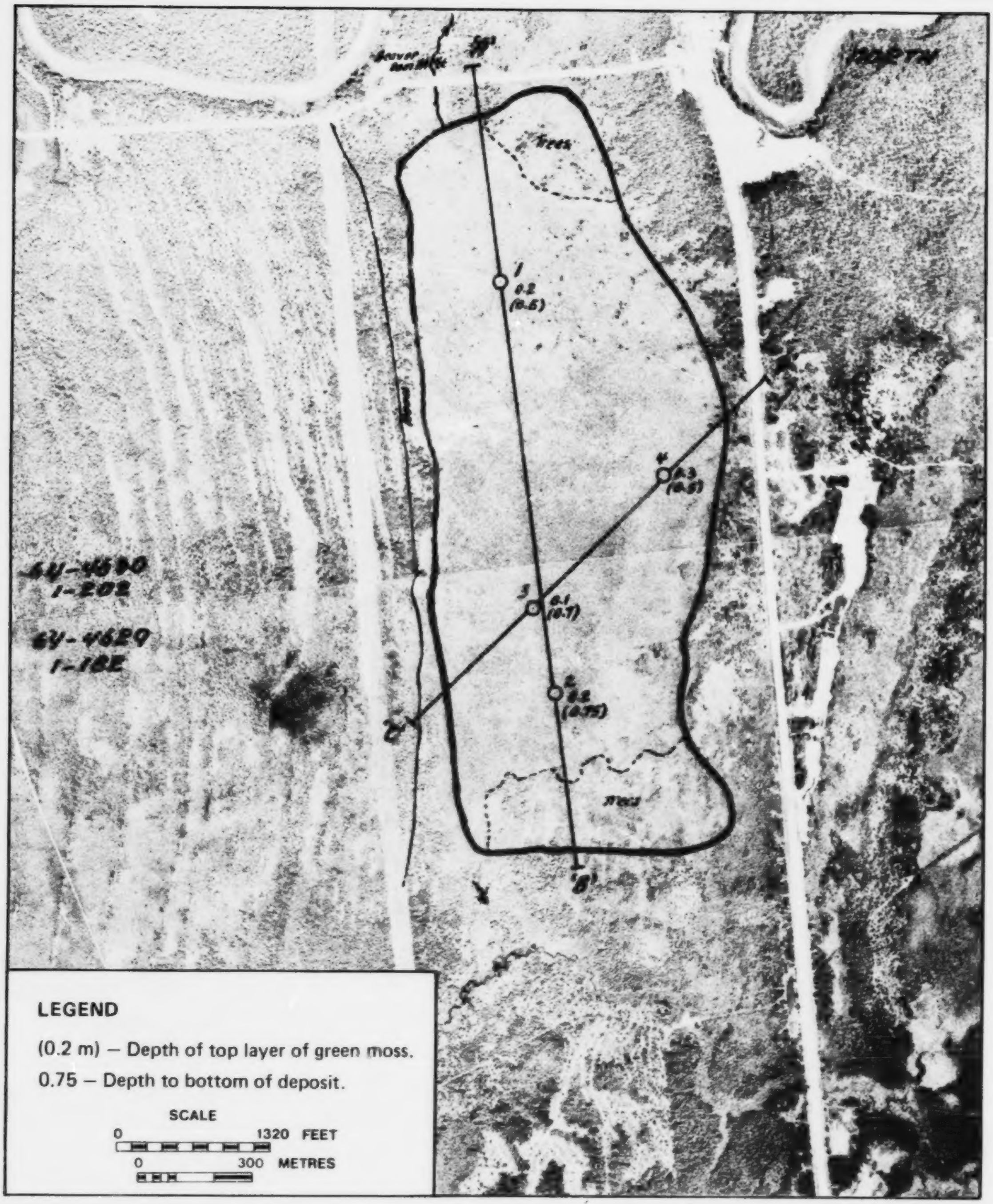

NORTH
Trees
1
0.2
(0.5)
4
0.3
(0.5)
3
0.1
(0.7)
2
0.2
(0.75)
Trees
6U-4590
1-20E
6U-4629
1-18E
LEGEND
(0.2 m) – Depth of top layer of green moss.
0.75 – Depth to bottom of deposit.
SCALE
0
1320 FEET
0
300 METRES

Photo 20–Air photograph, Deposit 11: Fenwick Township

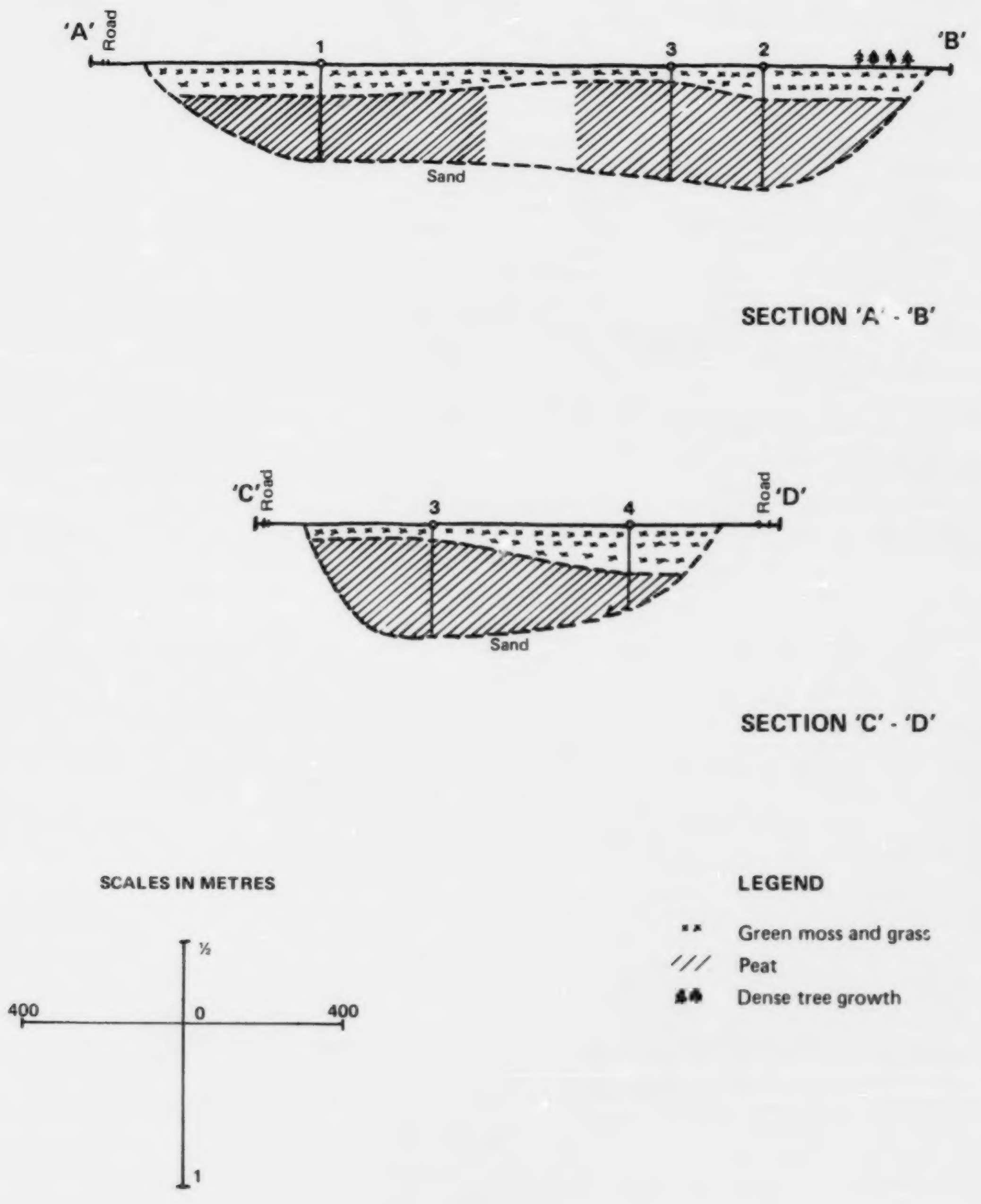

'A'
Road
1
3
2
'B'
Sand
SECTION 'A' - 'B'
'C'
Road
3
4
Road
'D'
Sand
SECTION 'C' - 'D'
SCALES IN METRES
½
400
0
400
1
LEGEND
Green moss and grass
Peat
Dense tree growth

Figure 12–Cross sections, locations shown on Photo 10, Deposit 11: Fenwick Township. (December 1975).

DEPOSIT 13: LYON TOWNSHIP

Location

This deposit is centred 6.4 km southwest of Robford on the Canadian National Railways. This deposit is 3.2 km southeast of Red Rock. The City of Thunder Bay lies 82 km to the southwest.

Access

Trails lead around the north end of the bog from the road to Robford. This road leads to Highway 628 which connects with Red Rock and with Highway 17, 3.2 km to the northwest. The Canadian Pacific Railway lies adjacent to the south side of Highway 628, 800 m northwest of the deposit. A lumber trail crosses the south end and a north-south survey line passes through the west-central part.

Area

This deposit has an area of 300 ha, extends north-south for 2.9 km, and has a maximum width of 1.9 km.

Surface

The initial airphoto examination based on 1962 photography indicated a dense growth of 0.5 to 1.0 m high coniferous trees. Timbered areas surrounding the deposit were clearly visible. Air photographs taken in 1975 indicate that growth has advanced to the degree that previously timbered areas are no longer visible and the trees on the deposit are much taller.

The northern part is heavily forested. The central and southern parts where growth is not as dense were selected for sampling. In this area, the overgrowth consists of alders, tamarack, and spruce. The alders attain heights of 1.2 to 1.8 m. The tamarack and spruce attain heights of 3 to 6 m and have a growth density interval of from 1.2 to 3.0 m.

The surface consists of a saturated carpet of sphagnum and grass. A few labrador tea (ledum) hummocks were noted. Some reeds occur at site 6.

Depth

The depth of this deposit varies from 1.9 to 2.3 m. The average depth as determined from 6 sites is 2.1 m.

Nature of Peat

A layer of sphagnum 0.15 to 0.4 m thick overlies a uniform woody, rooty H5 peat. The more important characteristics of the peat are listed below.

Drainage

A creek drains the bog southward and east into Nipigon Bay, Lake Superior 5.6 km distant. Alternatively, the deposit could be drained from the north and by ditching 800 m into Trout Creek which drains into Nipigon Bay. Levels would be required to accurately determine if the difference in elevation is sufficient to permit adequate drainage. The drop is estimated to be about 3 m.

Comments

Combined with Deposits 15 and 16, both in Lyon Township, this deposit is a potential source of fuel peat. Its root content and the heavy tree growth would result in relatively high field preparation and harvesting costs.

	Range	Average
Water percent	89.9-92.3	91.9
Ash Dry percent	6.1-9.7	7.9
Wet Vol. Dry Wt. gm/cc	0.09-0.12	0.11
Cal. Val. Kcal/Kgm	4700-5164	4810
S percent	0.18	0.18
P percent	0.05-0.08	0.06

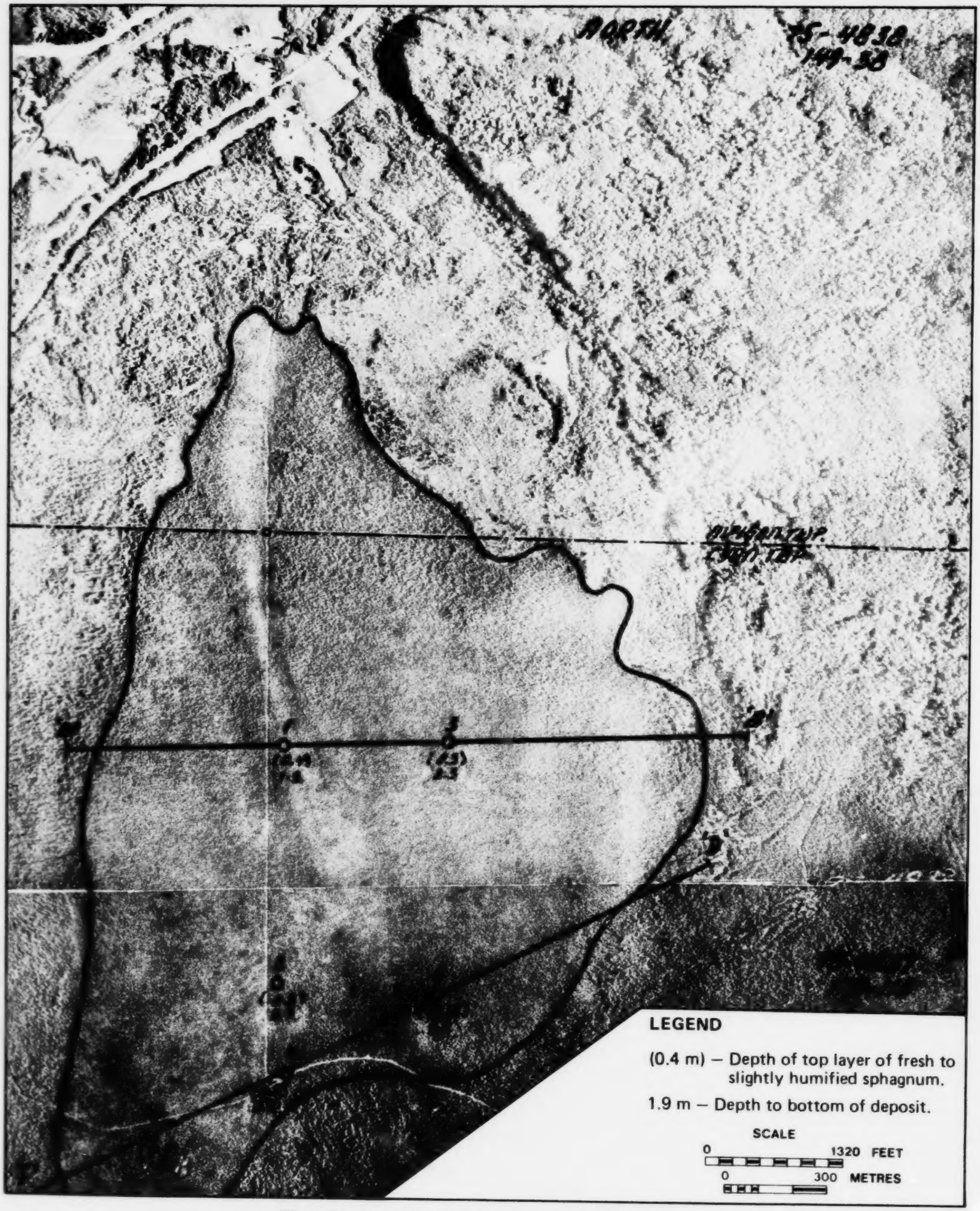
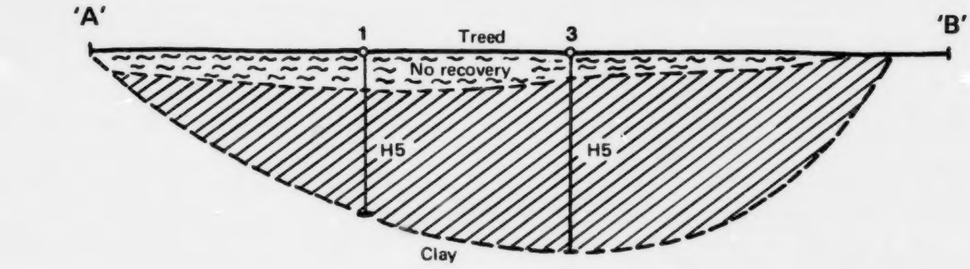
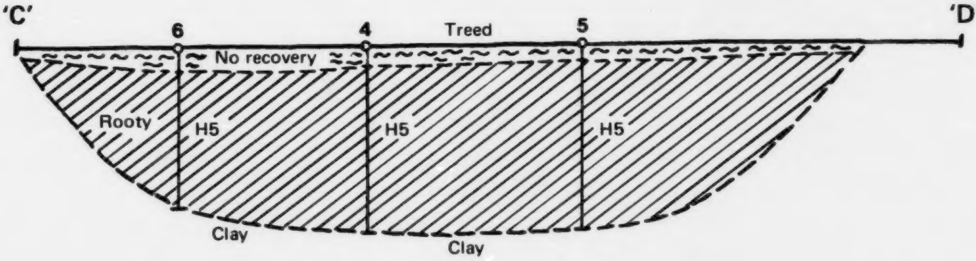

NORTH
75-4838
149-58
Lyon Twp.
LEGEND
(0.4 m) – Depth of top layer of fresh to slightly humified sphagnum.
1.9 m – Depth to bottom of deposit.
SCALE
0
1320 FEET
0
300 METRES

Photo 21–Air photograph, Deposit 13: Lyon Township

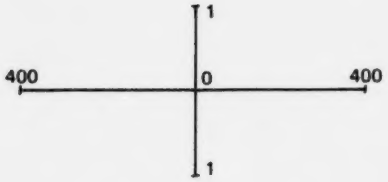

'A'
1
Treed
3
'B'
No recovery
H5
H5
Clay

SECTION 'A' - 'B'


'C'
6
4
Treed
5
'D'
No recovery
Rooty
H5
H5
H5
Clay
Clay

SECTION 'C' - 'D'

SCALES IN METRES



LEGEND

≈≈	Sphagnum
////	Peat
H5	Humification, von Post Scale

Figure 13–Cross sections, locations shown on Photo 21, Deposit 13: Lyon Township. (1978).

DEPOSIT 15: LYON TOWNSHIP

Location

This deposit is 14 km east and 7 km south of the northwest corner of the township. Hurkett on the Canadian National Railways and on the Canadian Pacific Railway lies 13.7 km to the west. Highway 582 connects Hurkett with Highway 17. Red Rock lies 6.4 km to the north. The Canadian Pacific Railway and the Canadian National Railways pass just west of Red Rock. The City of Thunder Bay lies 87 km to the southwest.

Access

Seven and three-quarter kilometres of road would be required to provide access to the deposit. Access for the field examination was via 8 km of lumber trails from Everard station on the Canadian National Railways. Lumber trails also lead into the deposit from Black Bay 4.5 km to the southwest.

Area

This is a nearly equidimensional bog of about 930 ha.

Surface

This deposit is characterized by a thin saturated sphagnum-polytrichum carpet supporting a grass-reed growth.

The surface is unstable in the western and southern parts where water is impounded between sphagnum hummocks. These areas are relatively open. They are characterized by a few alder shrubs with tamarack 1.5 to 2 m high at a density spacing of 7 to 12 m.

Elsewhere tree growth is dense. Spruce and tamarack averaging 3 m in height have a density spacing of 1.5 m with a fairly dense underbrush of alders.

Depth

The average depth determined from 12 sites is 1.8 m. The maximum depth of 4 m was obtained at site 9.

Nature of Peat

A uniform light fibrous H4 peat underlies a surface layer of 0.5 m of unhumified sphagnum moss. The average thickness of the peat in the three sites sampled is 1.3 m. The peat rests on a clay bottom.

There are many roots in this deposit which makes sampling difficult. Bottom was reached at eight of twelve sites but samples could be recovered at only three of the twelve sites. The main characteristics of this peat are listed below.

The ash content is highest in the bottom 0.5 m which averages 12.8 percent. The remainder averages 6.5 percent.

Drainage

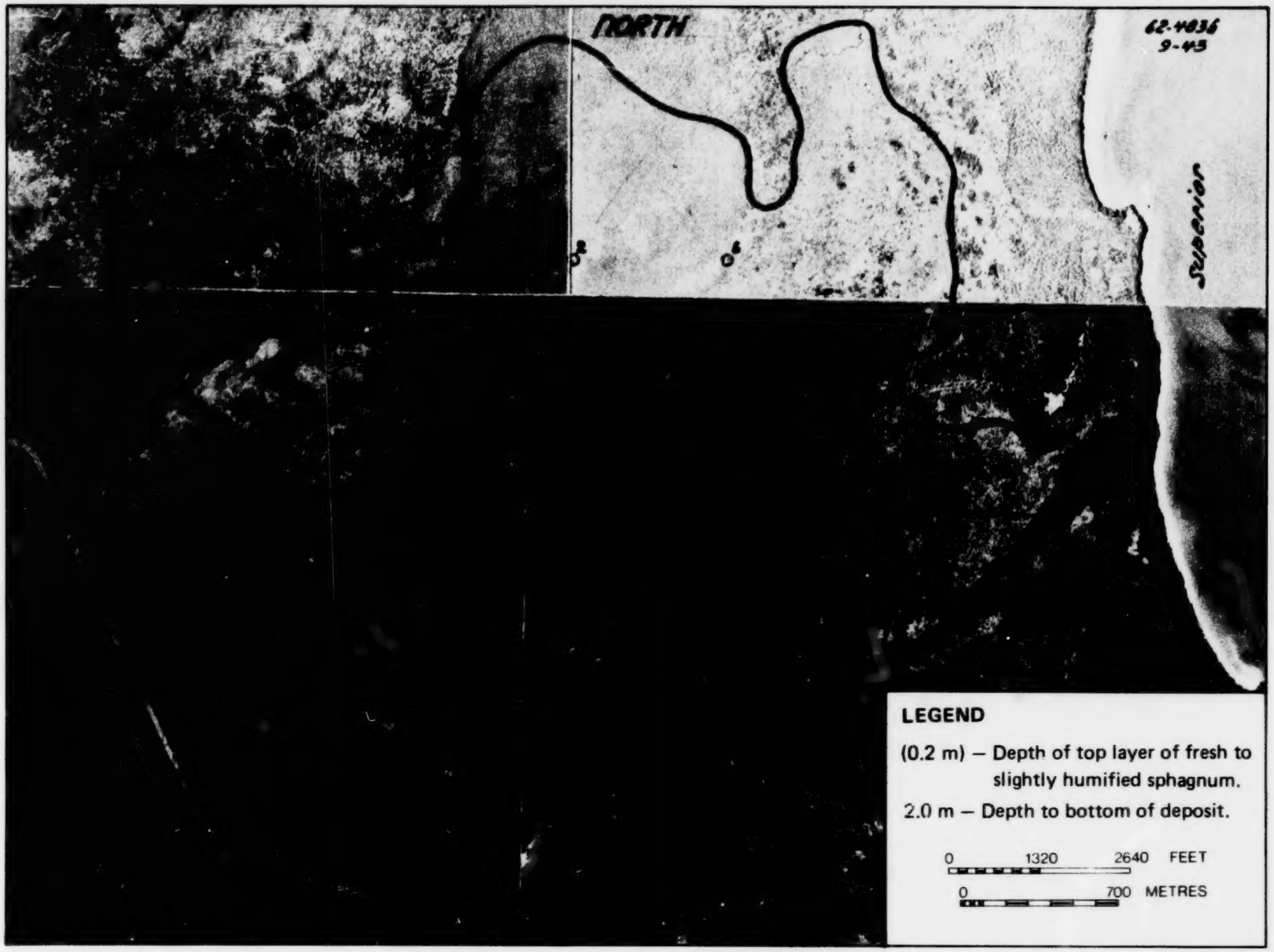
The bog is drained to the south by a creek flowing southwest into Black Bay, Lake Superior 4.8 km distant. Drainage could also be to the east into Nipigon Bay 800 m to the east.

Internal drainage is from east to west and thence south along the western part to the outlet creek.

Comments

There is insufficient humified moss to be of commercial interest. The depth of peat is slightly under the minimum requirement. However, this is somewhat offset by its large areal extent, and if combined with Deposits 13 and 16 in Lyon Township, it does represent a potential source of fuel peat. Access to the deposit is more remote than for the other deposits examined. This and its rooty nature will result in higher than normal preparation and production costs.

	Range	Average
Water percent	88.6-94.6	92
Ash Dry percent	4.7-15.6	8.6
Wet Vol. Dry Wt. gm/cc	0.07-0.15	0.08
Cal. Val. Kcal/Kgm	4787-5164	4982
S percent	0.13-0.57	0.28
P percent	.05-.06	0.05


NORTH
62-4836
9-43
Superior

LEGEND

(0.2 m) – Depth of top layer of fresh to slightly humified sphagnum.

2.0 m – Depth to bottom of deposit.

0
1320
2640
FEET
0
700
METRES

Photo 22–Air photograph, Deposit 15: Lyon Township

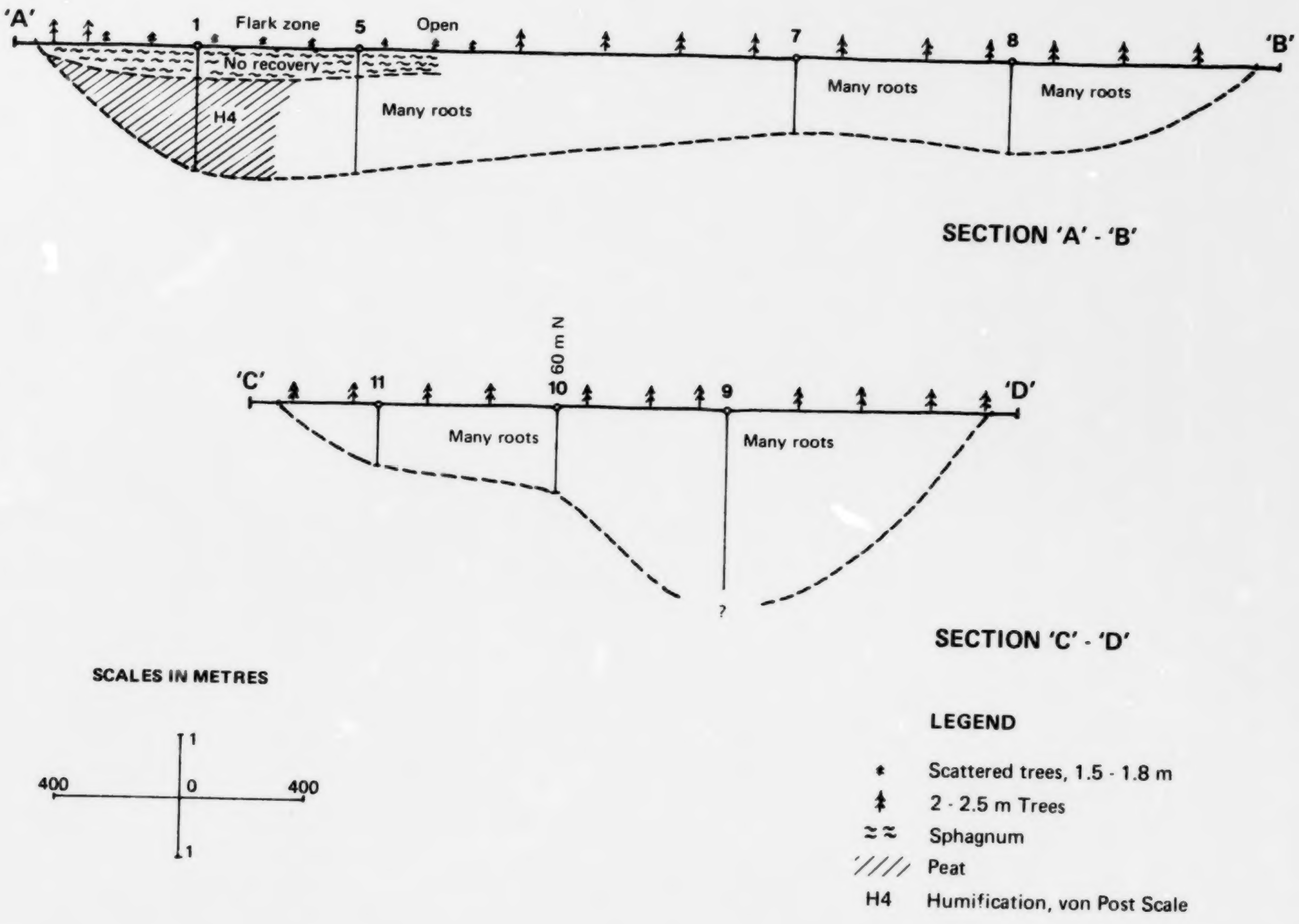

'A'
1
Flark zone
5
Open
7
8
'B'
No recovery
H4
Many roots
Many roots
Many roots
SECTION 'A' - 'B'
60 m N
'C'
11
10
9
'D'
Many roots
Many roots
?
SECTION 'C' - 'D'
SCALES IN METRES
1
400
0
400
1
LEGEND
Scattered trees, 1.5 - 1.8 m
2 - 2.5 m Trees
Sphagnum
Peat
H4 Humification, von Post Scale

Figure 14–Cross sections, locations shown on Photo 22, Deposit 15: Lyon Township. (1978).

DEPOSIT 16: LYON TOWNSHIP

Location

This deposit is centred on the south boundary of Lyon Township and is 12.7 km south and 13.7 km east of the township's northwest corner. Hurkett and Red Rock on the Canadian National Railways and Canadian Pacific Railway lie respectively 14.5 km to the northwest and north. The City of Thunder Bay is 80 km to the southwest.

Access

Access would require about 11.7 km of road. Trails lead into the bog from Black Bay 2 km to the west. A lumber trail crosses the bog 1200 m north of the south boundary of the open area.

The deposit was examined in the field by helicopter.

Area

Deposit 16 is elongated, extending north-south for approximately 4.8 km and attaining a maximum width of 2 km. It is divided into east and west parts by a north-trending esker-like ridge about 1.5 to 3 m high. The eastern section has an area of 340 ha and the western section 159 ha.

Surface

The western part of the bog is covered with a very dense growth of trees and was not sampled.

The surface of the eastern part has a hummocky sphagnum cover with associated grass, labrador tea (ledum), and reeds. The surface is saturated. The south end is the wettest and contains the least tree growth. Tamarack and cedar predominate, averaging 30 to 60 cm high with some spruce averaging 2.4 m in height. Alders are also present in this area and average 3 to 4.5 m in height. Elsewhere tree growth is fairly uniform and consists of spruce, tamarack, and locally some cedar 3 to 4.5 m high with a growth density spacing of 1.5 m.

Depth

The average depth as determined at seven sites is 1.7 m. A maximum depth of 2.3 m was obtained in the east-central part at site 5.

Nature of Peat

The surface layer of fresh sphagnum varies from 0.25 to 0.4 m in thickness. Underlying the sphagnum is rooty H4 to H7 sedge reed peat resting on a sandy clay bottom. The bottom 0.5 m has a tendency to be slightly richer in ash and somewhat more humified than the overlying peat. The main characteristics of the peat are listed below.

	Range	Average
Water percent	82.8-91.6	88.5
Ash Dry percent	7.3-12.6	10.1
Wet Vol. Dry Wt. gm/cc	0.09-0.15	0.12
Cal. Val. Kcal/Kgm	4453-5019	4740
S percent	0.11-0.25	0.18
P percent	0.04-0.05	0.045

Drainage

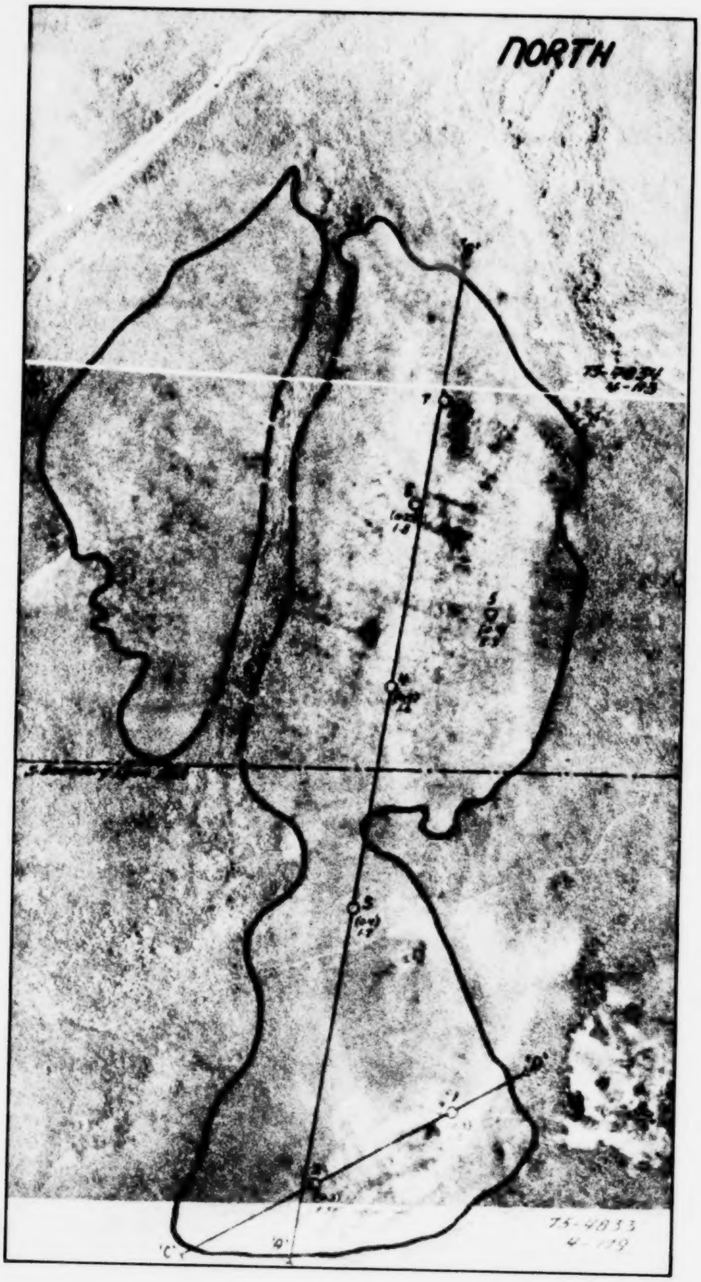
This deposit lies in the lowest part of the peninsula separating Black Bay and Nipigon Bay on Lake Superior. A raised shoreline lies 1.2 km to the east. The area between the bog and the old shoreline is gently undulating.

Whereas the topographic map shows creeks draining from the deposit, a helicopter examination did not reveal this to be the case. A creek flows southwest into Black Bay 400 m west of the north end of the deposit. Drainage from the central part would require 1.9 km of ditching to the west into Black Bay.

Internal drainage, judging from the moisture content of the peat and from the bog pattern, is from the central part both to the north and south.

Comments

Access is difficult. This, along with a somewhat rooty nature and shallow depth, limits its use as a potential source of peat, although it would provide a source to augment production from Deposit Numbers 13 and 15, also in Lyon Township. There is insufficient unhumified moss to be of commercial interest.


NORTH
'C'
'A'
75-4833
4-179

LEGEND

(0.3 m) – Depth of top layer of fresh to slightly humified sphagnum.

1.6 m – Depth to bottom of deposit.

0 1320 2640 FEET

0 700 METRES

Photo 23–Air photograph, Deposit 16, Lyon Township

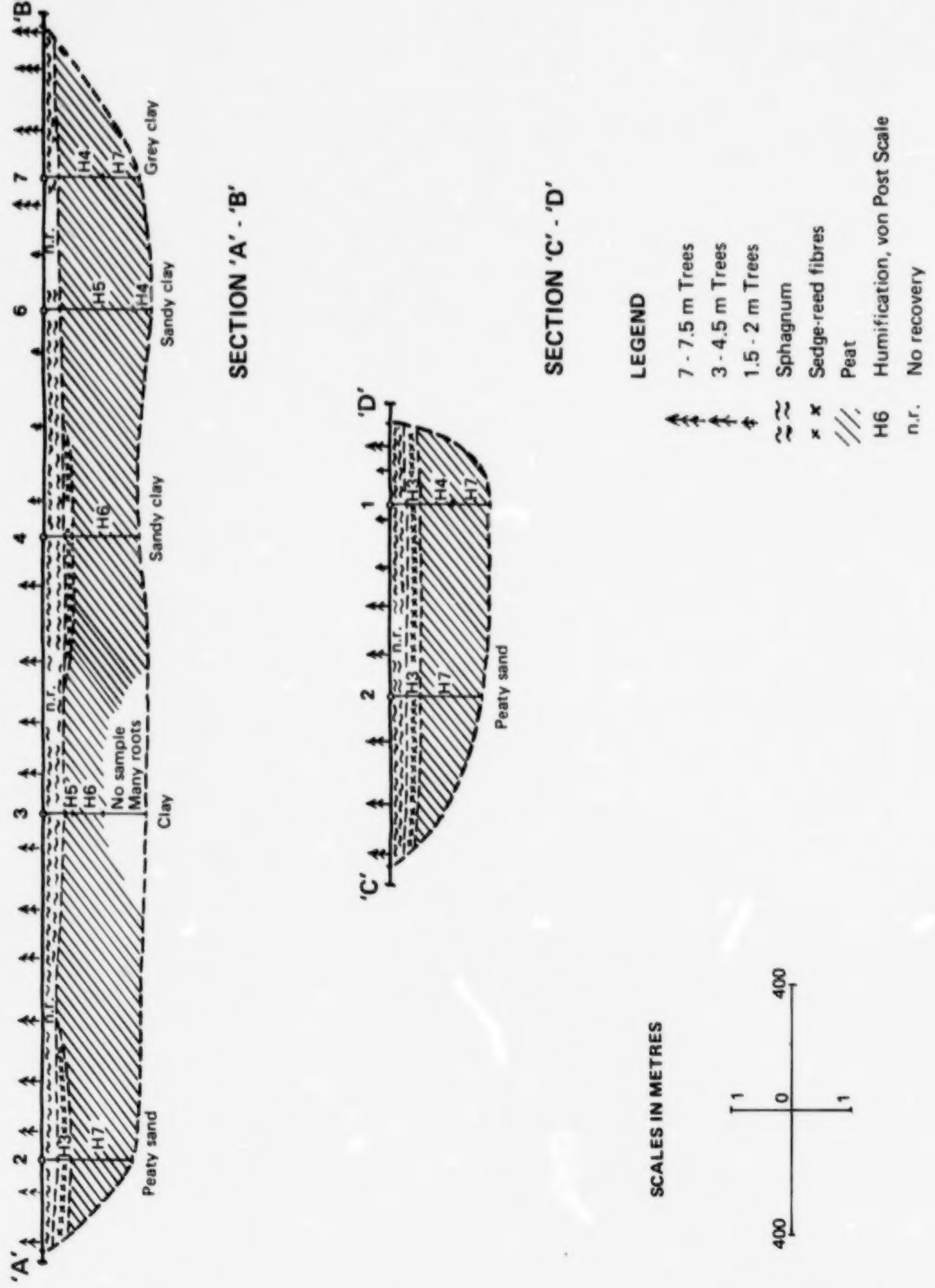

'A'
'B'
2
3
4
6
7
H3
H7
H5
H6
No sample
Many roots
n.r.
H4
Peaty sand
Clay
Sandy clay
Grey clay
SECTION 'A' - 'B'
'C'
'D'
1
2
H3
H7
H4
n.r.
Peaty sand
SECTION 'C' - 'D'
LEGEND
7 - 7.5 m Trees
3 - 4.5 m Trees
1.5 - 2 m Trees
Sphagnum
Sedge-reed fibres
Peat
H6 Humification, von Post Scale
n.r. No recovery
SCALES IN METRES
400
0
400
1
1

Figure 15–Cross sections, locations shown on Photo 23, Deposit 16: Lyon Township. (1978).

DEPOSIT 18: CONACHER TOWNSHIP

Location

This deposit is centred 4 km east and 3.2 km south of the northwest corner of the township. Shebandowan, just south of Highway 11, lies 2.4 km to the east. The City of Thunder Bay lies 64 km to the southeast.

Access

Highway 11 passes 400 m south of the southeast end of the deposit. The Canadian National Railways crosses Highway 11, 2.5 km west of the turn to Shebandowan. Access to the south side of the deposit is achieved by proceeding northwest along the railway for 600 m.

A power line, not shown on current maps, crosses the railway about 510 m northwest of the road.

Area

An open area supporting a growth of sparsely scattered spruce with a few small densely forested islands comprises approximately 111 ha. The open area extends east-west for 1890 m and varies from 240 to 850 m in width.

Surface

The surface has a very slight crown in the central part. It consists of a thick, hummocky sphagnum fuscum carpet, intermixed with sparse eriophorum and labrador tea growing to a height of 0.3 m. The overgrowth consists of scattered stunted spruce averaging 1 m in height and 7 cm thick at the stump. Intermixed are a few larger spruce 2 m high at the west end and in the north-central part are a few islands of dense spruce 4.5 to 6 m high.

Depth

The depth where sampled varies from 2.4 to 2.5 m and the deposit rests on a grey to greenish grey plastic clay bottom.

Nature of Peat

The surface layer of sphagnum varies from 0.25 to 0.5 m in thickness. It rests on a fine-grained dark brown peat with an ash content of 5.79 to 14.7 percent and a water content of 85 to 88 percent averaging 86.8 percent. No roots were encountered during the sampling.

Drainage

The swamp river meanders along the north side and through the eastern part of the deposit. The water level is nearly at ground level. The slight crown in the central part is not sufficient to allow for drainage of this part. The river represents a serious drainage problem as there does not appear to be a practical way to divert it and creeks drain into the deposit from the north.

Comments

There is insufficient moss to be of interest and the area is too small to be regarded as a source of fuel peat at this time.

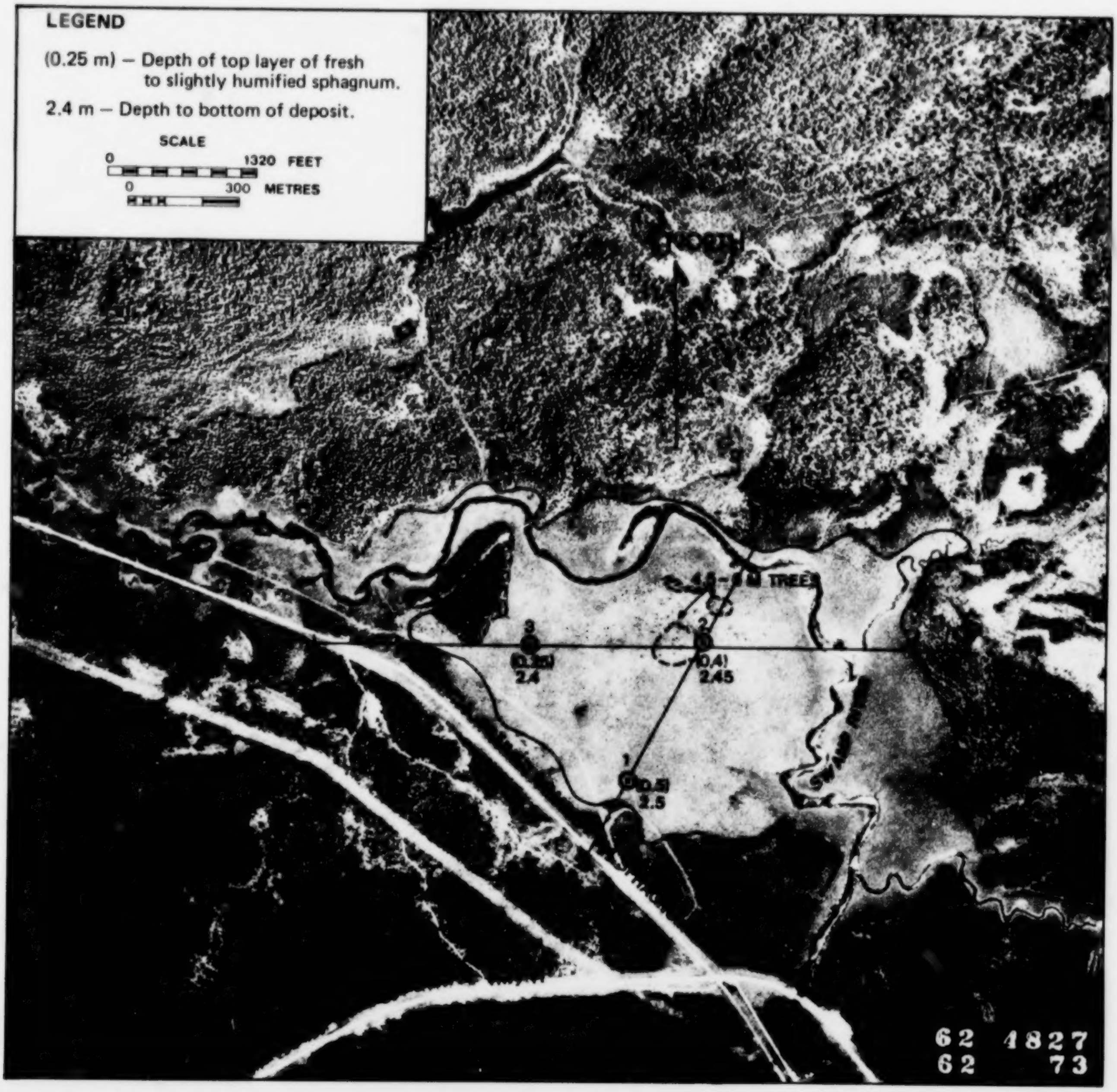

LEGEND
(0.25 m) – Depth of top layer of fresh to slightly humified sphagnum.
2.4 m – Depth to bottom of deposit.
SCALE
0
1320 FEET
0
300 METRES
NORTH
M TREES
3
(0.25)
2.4
2
(0.4)
2.45
1
(0.5)
2.5
62 4827
62 73

Photo 24–Air photograph, Deposit 18: Conacher Township

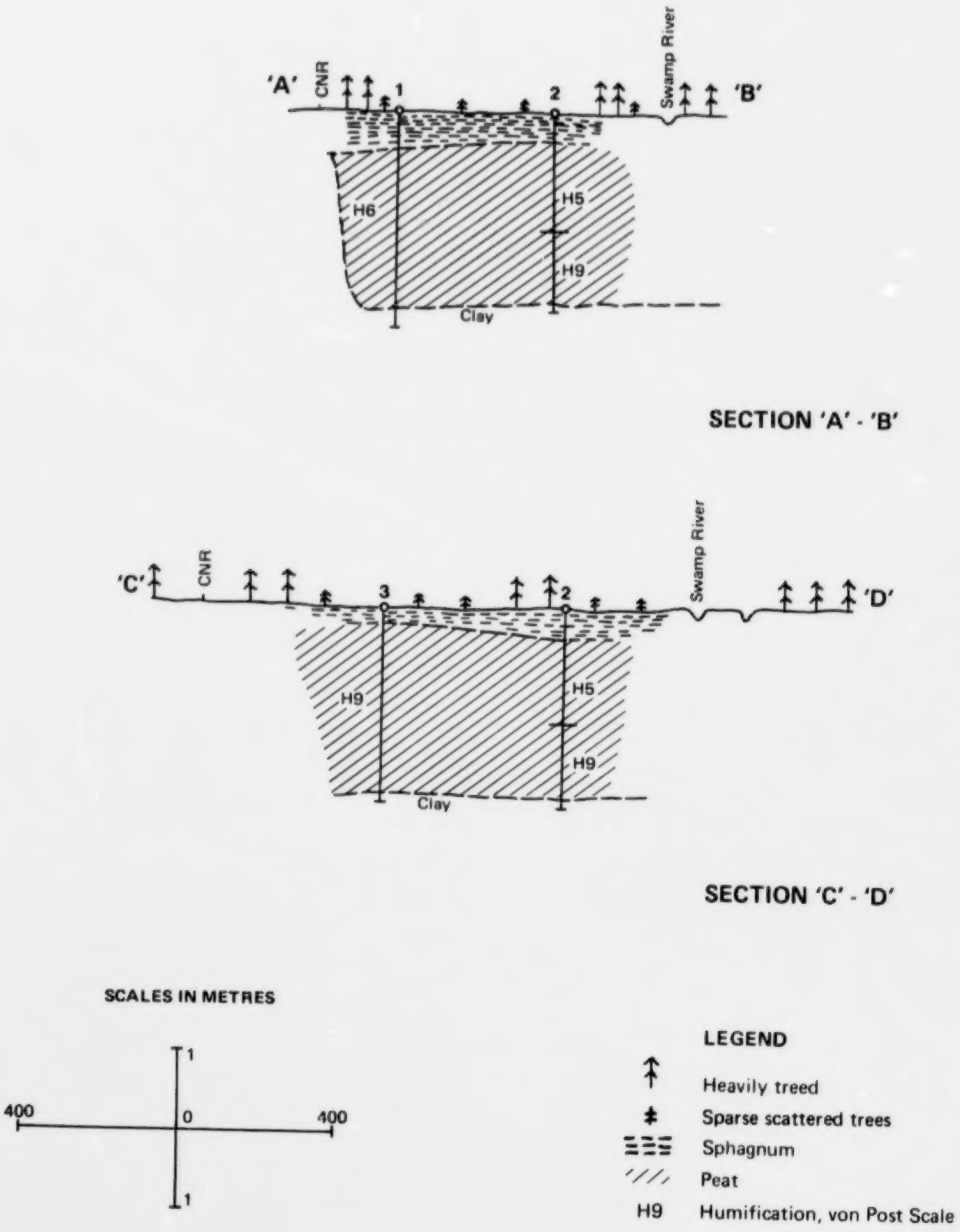

'A'
CNR
1
2
Swamp River
'B'
H6
H5
H9
Clay
SECTION 'A' - 'B'
'C'
CNR
3
2
Swamp River
'D'
H9
H5
H9
Clay
SECTION 'C' - 'D'
SCALES IN METRES
1
400
0
400
1
LEGEND
Heavily treed
Sparse scattered trees
Sphagnum
Peat
H9
Humification, von Post Scale

Figure 16–Cross sections, location shown on Photo 24, Deposit 18: Conacher Township. (1978).

DEPOSIT 21: FALLIS TOWNSHIP

Location

Deposit 21 is centred 5.6 km west of the northeast corner of Fallis Township and extends north into Gibbard Township. The City of Thunder Bay lies 8.7 km to the southeast.

Access

The Canadian Pacific Railway and Highway 17 cross the southern end of the deposit 6.9 km west of Argon Creek. The southern part can be reached directly from the road. The northern part is best reached by following a north-trending ridge along the west side for 1160 m where the pipeline crosses the deposit.

Area

Air photographs taken in 1962 indicated the presence of an open area of some 172 ha within the extensive Savanne River—Muskeg Lake bog system. This area now contains a dense growth of alders.

Surface

The surface is covered with a thin layer of sphagnum and grass supporting the alder growth with sparsely scattered spruce and tamarack. Some birch is present in the southern part.

At the northern end the surface cover is humified with abundant reeds and alders up to 2.5 m high. Still farther north, coniferous trees become progressively more abundant at the expense of the alders.

Depth

This deposit is the shallowest of those examined. It varies in depth from 0.2 m in the northern part to 3 m in the south-central part and 1.75 m just north of the railway. It rests on a clay bottom.

Nature of Peat

The surface layer of sphagnum varies from nil in the northern part to 0.4 m in the south-central part underlain by 0.2 to 2.6 m of peat containing many roots. The ash content is high, mostly between 7 and 8 percent with anomalously high values of 78 and 32.4 percent at the northern end where the deposit is shallow. These high values could be due to admixed clay although this was not observed in the samples.

The water content varies from 65 to 92 percent and averages 85.8 percent.

Drainage

The natural drainage is southward into the Savanne River. A creek along the western side has been extended south by ditching. Ditches also enter the bog from the north and northeast. Ditching has also been carried out to the south about 800 m east of the area under consideration. The reed cover in the northern part indicates that the area is periodically inundated. The numerous drainage outlets permit faster than normal run-offs and frequent variations in the water-table. This no doubt accounts for the lower than average water content in the deposit. These conditions and a relatively high content of dissolved salts in the influx waters contribute to the dense alder growth and the lack of sphagnum moss.

Comments

The area examined has more of the characteristics of a swamp than a bog. The rooty nature, limited area, and shallow depth of this deposit precludes its use as a potential source of fuel peat. There is insufficient unhumified moss to be of interest.

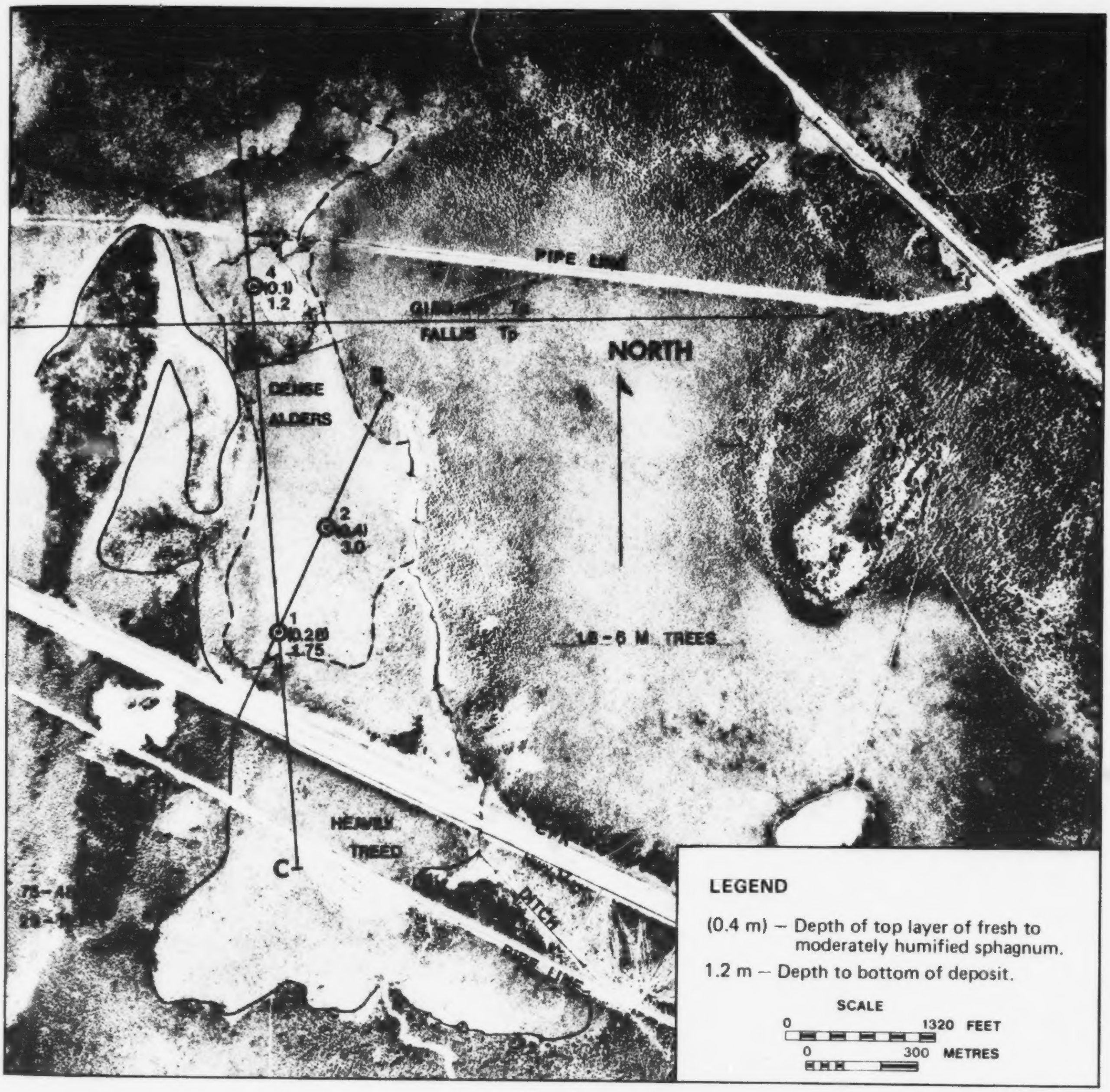

PIPE LINE
FALLIS Tp
NORTH
DENSE
ALDERS
4
(0.1)
1.2
2
(0.4)
3.0
1
(0.28)
1.75
TREES
HEAVILY
TREED
C
DITCH
PIPE LINE
LEGEND
(0.4 m) – Depth of top layer of fresh to moderately humified sphagnum.
1.2 m – Depth to bottom of deposit.
SCALE
0
1320 FEET
0
300 METRES

Photo 25–Air photograph, Deposit 21: Fallis Township

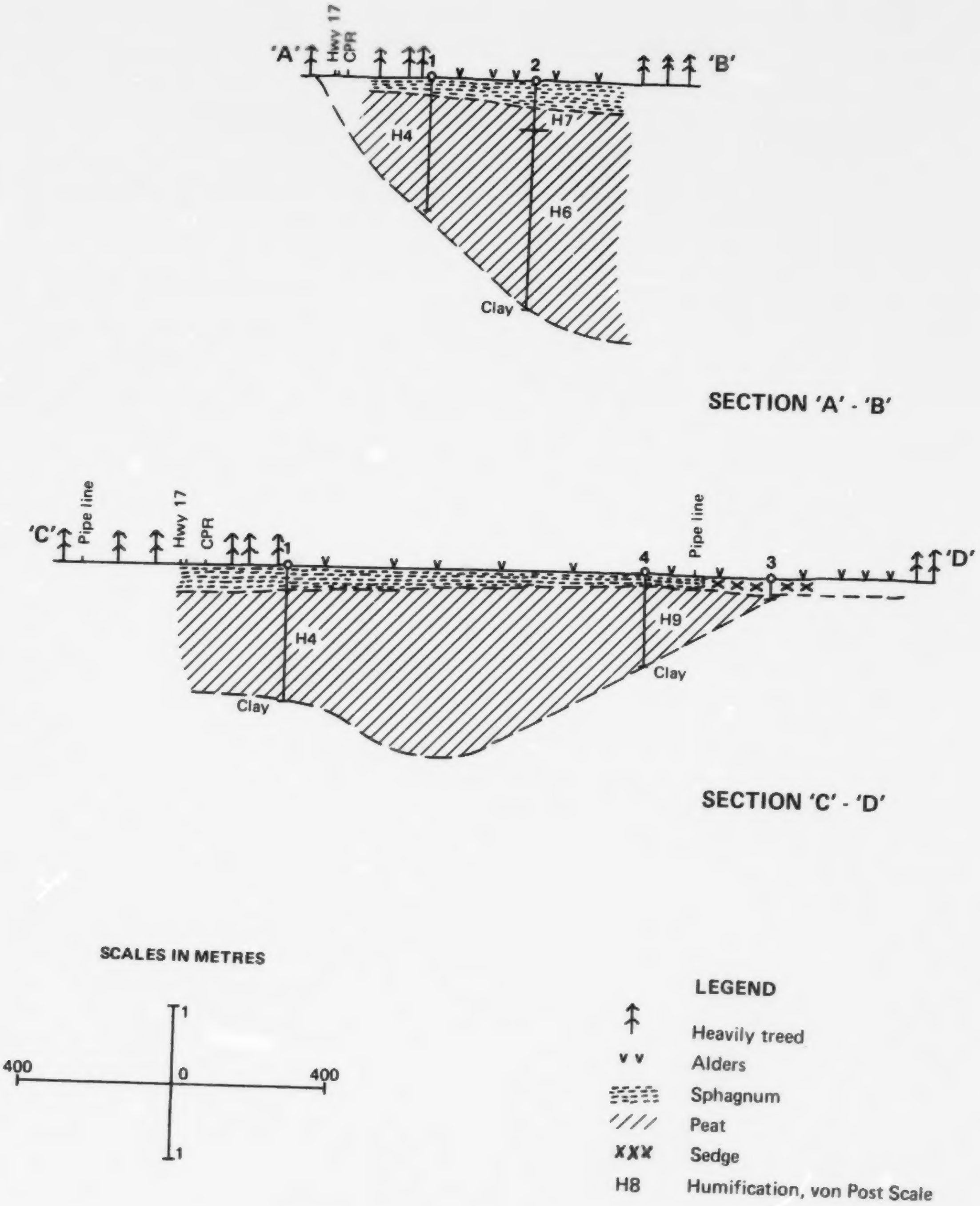

'A'
Hwy 17
CPR
1
2
'B'
H4
H7
H6
Clay
SECTION 'A' - 'B'
'C'
Pipe line
Hwy 17
CPR
1
4
Pipe line
3
'D'
H4
H9
Clay
Clay
SECTION 'C' - 'D'
SCALES IN METRES
1
400
0
400
1
LEGEND
Heavily treed
Alders
Sphagnum
Peat
Sedge
H8 Humification, von Post Scale

Figure 17–Cross sections, location shown on Photo 25, Deposit 21: Fallis Township. (1978).

DEPOSIT 22: GIBBARD TOWNSHIP

Location

This deposit is centred 3.2 km north and 4.8 km east of the southwest corner of the township. The City of Thunder Bay lies 8.4 km to the southwest.

Access

The Canadian National Railways passes along the southwestern side of the deposit. The Canadian Pacific Railway and Highway 17 lie 4.8 km to the south. A minimum of 4.8 km of road would be required for access . Lumber trails, passable with the Bombardier tractor, extend north from Highway 17, 3.7 km east of Savanne, to the northwestern end of Deposit 23: Gibbard Township. Deposit 22: Gibbard Township can then be reached by proceeding southeast along the Canadian Pacific Railway right-of-way for 4 km.

Area

This deposit forms part of the large Savanne River—Muskeg Lake interconnected muskeg system. An area of some 150 ha was initially selected for sampling. On field inspection it was found that heavy tree growth had encroached into the northwestern and western parts. The remaining area of openly wooded muskeg consisting of 93 ha was sampled.

Surface

The surface cover consists of hummocky sphagnum and associated grasses. Reeds were noted at site 1 and ledum at site 4. Alder underbrush 70 cm high is present in the northern part of the area surveyed. The overgrowth is mainly spruce 1.5 to 3 m high with sparse tamarack. Growth density spacing is 2 to 3 m. To the north of the area surveyed, the bog is rimmed with a dense forest of spruce.

Depth

An average depth of 3.8 m is indicated from four sample sites. The maximum depth of 4 m was obtained at site 4 in the northwestern part of the deposit.

Nature of Peat

A thickness of 0.4 to 0.6 m of fresh sphagnum overlies H4 to H6 sphagnum sedge peat resting on a soft grey clay bottom. The water content varies from 88.7 to 91.5 percent and averages 90.7 percent. The ash content varies from 8.6 to 14.9 percent and averages 10.8 percent.

Drainage

A ditch leads south from the Canadian Pacific Railway at the southeastern end of the deposit. It drains through Deposit 21: Fallis Township and into the Savanne River, a distance of 6.4 km. The drop in this distance is estimated to be about 9 m.

Comments

There is insufficient sphagnum moss present to be of commercial interest and the area is too limited to be regarded as a potential source of fuel peat.

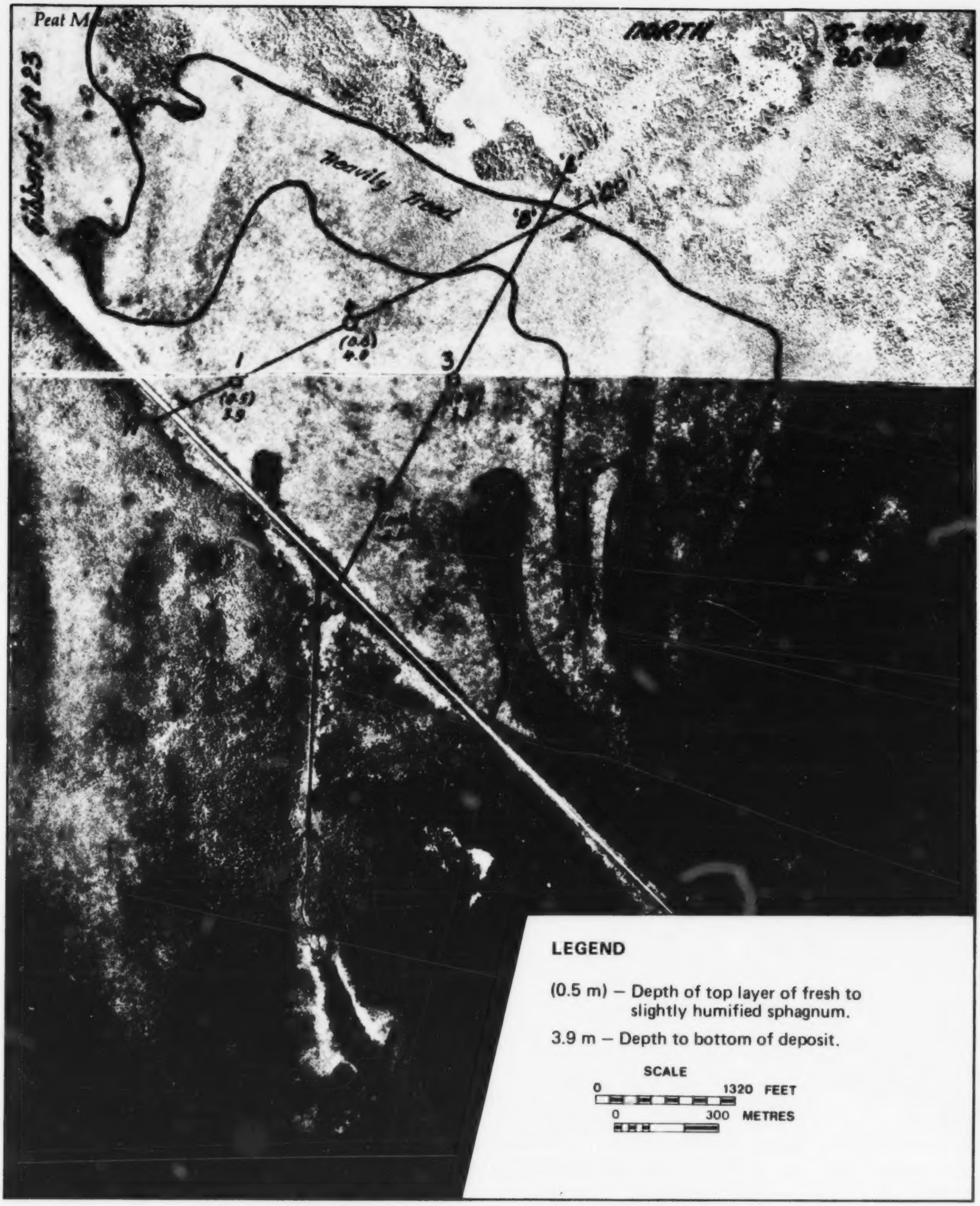

Peat M
NORTH
Gibbard-[illegible]23
Heavily Treed
'B'
(0.8)
4.0
1
(0.5)
3.9
3
LEGEND
(0.5 m) – Depth of top layer of fresh to slightly humified sphagnum.
3.9 m – Depth to bottom of deposit.
SCALE
0
1320 FEET
0
300 METRES

Photo 26–Air photograph, Deposit 22: Gibbard Township

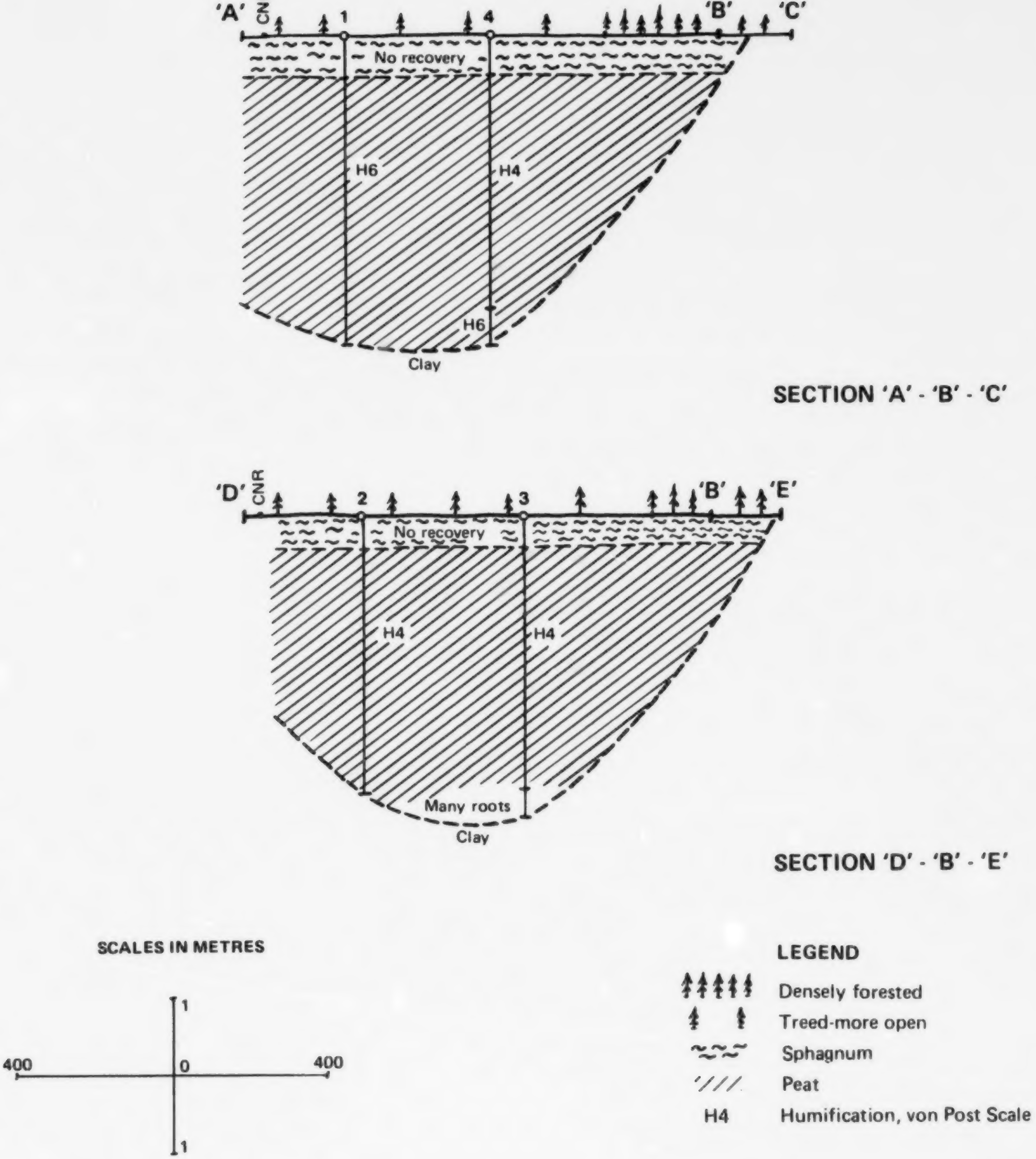

'A'
CNR
1
4
'B'
'C'
No recovery
H6
H4
H6
Clay
SECTION 'A' - 'B' - 'C'
'D'
CNR
2
3
'B'
'E'
No recovery
H4
H4
Many roots
Clay
SECTION 'D' - 'B' - 'E'
SCALES IN METRES
1
400
0
400
1
LEGEND
Densely forested
Treed-more open
Sphagnum
Peat
H4 Humification, von Post Scale

Figure 18–Cross sections, locations on Photo 26, Deposit 22: Gibbard Township. (1978).

DEPOSIT 23: GIBBARD TOWNSHIP

Location

Deposit 23: Gibbard Township adjoins Deposit 22, Gibbard Township on the northwest, adjacent to the north side of the Canadian National Railways. It is centred 2 km east of the southwest corner of the township. The City of Thunder Bay lies 9.6 km to the southeast.

Access

A minimum of 4.8 km of road would be required to reach Deposit 22 from which Deposit 23 could be serviced. Access by Bombardier tractor to the northwestern end of the deposit has been described in the section on Deposit 22: Gibbard Township.

Area

This is an elongated bog extending 5 km to the northwest with an average width of about 400 m. It is wooded to varying degrees. The least forested section, comprising approximately 313 ha, was sampled.

Surface

In the northern part, standing water lies between sphagnum hummocks. Pitcher plants, reeds, and grass are abundant. In the northeastern part at sites 3 and 4 and in the central part at site 7, the surface is also hummocky but drier. Elsewhere the surface is even and consists of a cover of saturated sphagnum and grass.

The overgrowth consists of spruce 1.5 to 4.6 m high with a density spacing of 1.5 m. The undergrowth is alder 60 to 75 cm high. Tamarack predominates in the wet area between sites 1 and 2.

Depth

The average depth as determined from seven sample sites is 2.6 m. It is deepest at site 3 (4 m) in the northeastern part. It is shallowest at the southeastern end where the depth is 0.9 m.

Nature of Peat

A thickness of 0.2 to 0.6 m of fresh sphagnum overlies peat resting on a sandy clay bottom. The northern and northeastern parts consist of light fibrous H4 peat with a low ash content. The remainder of the deposit is a dense heavier H6 to H7 peat. Roots are sufficiently abundant to retard the rate of sampling.

The moisture content of the peat ranges from 85.6 to 94.1 percent and averages 89.6 percent. The ash content ranges from 1.9 to 27.8 percent. The high value represents a 0.5 m bottom layer containing many roots. Excluding this anomalously high result, the average ash content is 7.5 percent.

Drainage

The deposit could be drained by ditching into the ditch along the right-of-way of the Canadian National Railways. From there a ditch leads south for 1.2 km into Red Rock which eventually drains into the Savanne River 10.5 km to the south of the railway. The drop in elevation is estimated to be approximately 12 m.

Comments

There is insufficient sphagnum moss present to be of commercial interest. The area, even if combined with Deposit 22, is too limited to be regarded as a potential source of fuel peat at this time.

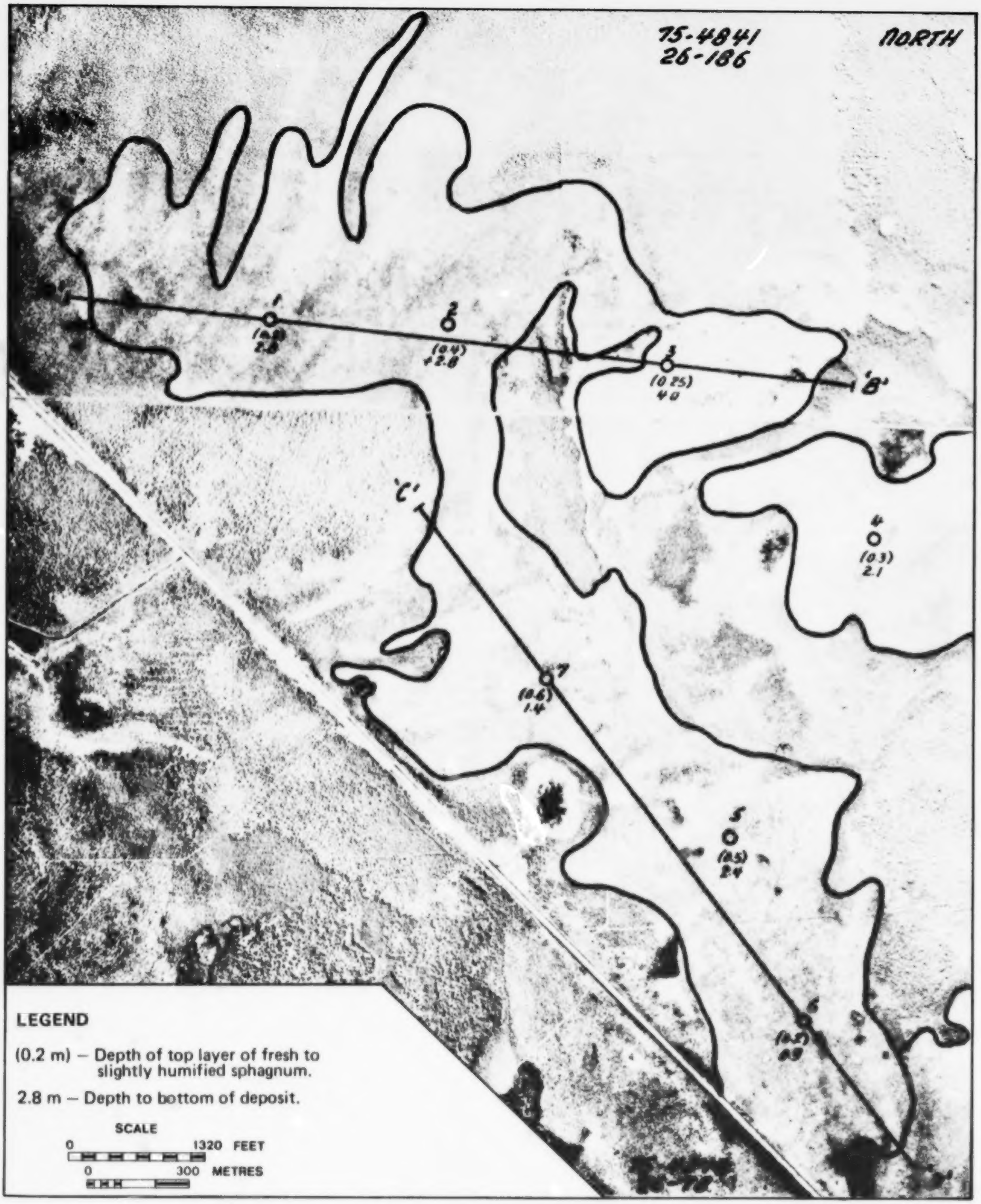

75-4841
26-186
NORTH
1
2.8
2
(0.4)
+2.8
3
(0.25)
4.0
'B'
'C'
4
(0.3)
2.1
7
(0.6)
1.4
5
(0.5)
2.4
6
LEGEND
(0.2 m) – Depth of top layer of fresh to slightly humified sphagnum.
2.8 m – Depth to bottom of deposit.
SCALE
0
1320 FEET
0
300 METRES

Photo 27–Air photograph, Deposit 23: Gibbard Township

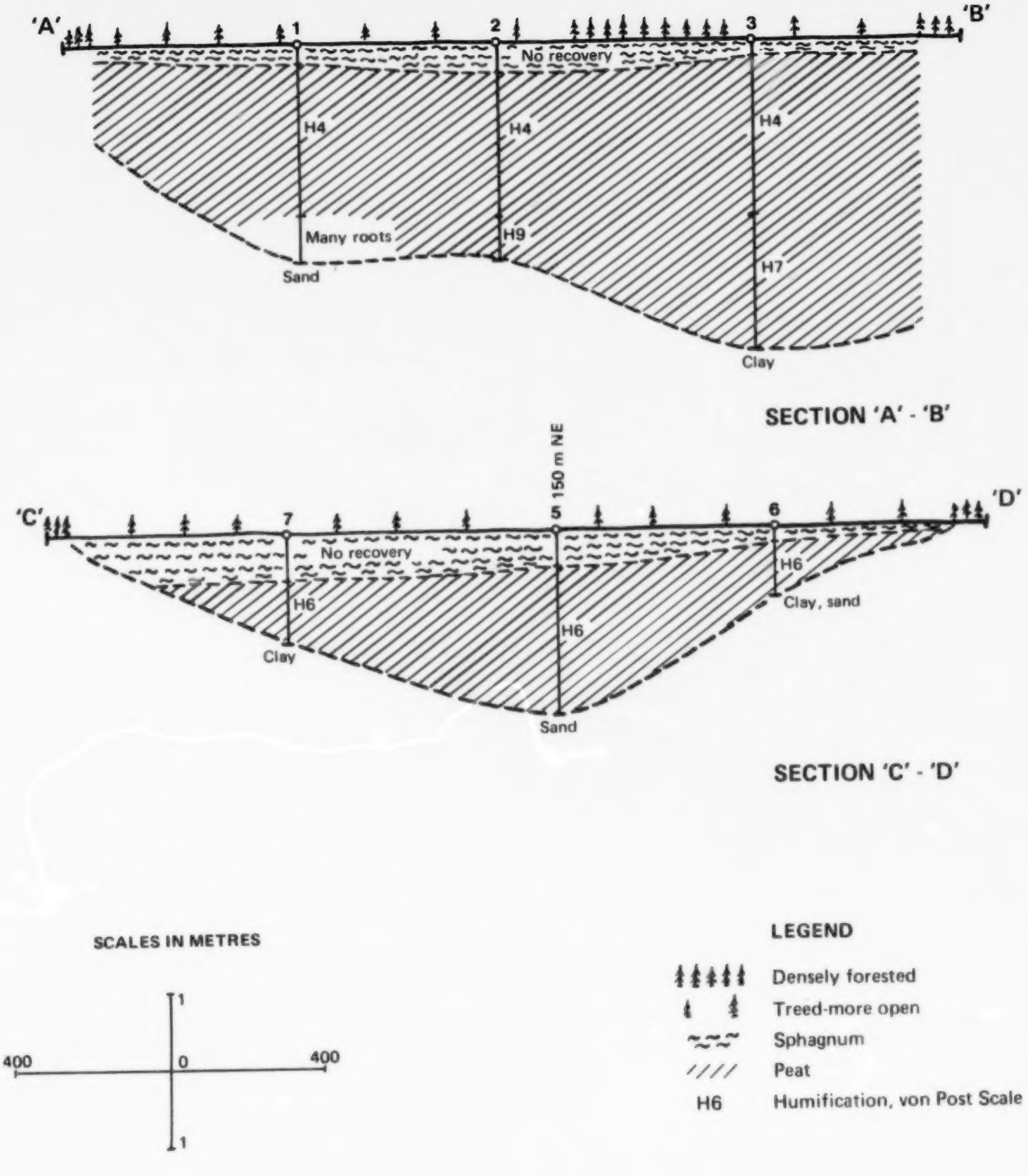

'A'
1
2
3
'B'
No recovery
H4
H4
H4
Many roots
H9
H7
Sand
Clay
SECTION 'A' - 'B'
150 m NE
'C'
7
5
6
'D'
No recovery
H6
H6
H6
Clay, sand
Clay
Sand
SECTION 'C' - 'D'
SCALES IN METRES
1
400
0
400
1
LEGEND
Densely forested
Treed-more open
Sphagnum
//// Peat
H6 Humification, von Post Scale

Figure 19–Cross sections, locations on Photo 17, Deposit 23: Gibbard Township. (1978).

DEPOSIT 24: STEDMAN TOWNSHIP

Location

This deposit is centred 1.6 km east and 2 km south of the northwest corner of the township. Upsala lies 4.8 km to the east via Highway 17. The City of Thunder Bay lies 80 miles to the southeast.

Access

The Canadian Pacific Railway and Highway 17 pass by the southwest end of the deposit. The north-central part can be reached on foot by lumber trails leading west from the road leading north from Highway I7 to Graham on the Canadian National Railways.

Area

This deposit is a large and irregularly shaped bog with numerous embayments and densely forested islands. An area of minimum tree growth with open grassy areas comprising some 263 ha was selected for examination.

Surface

The western side is occupied by an open elongated flark zone 1500 m long. The northern tip of the zone coincides with a drainage entry and the zone is narrowest at this point. Seven hundred and sixty metres farther south the zone widens abruptly from 75 m to 150 m and continues to within 150 m of the southern end of the deposit. An outlet ditch leads south from the deposit 300 m farther to the south.

A second partially developed flark zone occupies the northern part of the area examined. This zone extends east-west for about 975 m and averages 220 m in width with a narrow strip extending an additional 600 m to the west. The western end appears to be related to inlet drainage. The eastern end has poorly defined drainage into the Stedman River 450 m to the east.

The flarks are parallel, elongated, wet muddy shallow troughs in the sphagnum surface, a few metres wide. They are due to surface stretching or creep, and most commonly occur on the shoulders of high moor bogs. Here the flark zone appears to be due to creep from the drainage pattern. The orientation of the flarks is perpendicular to the direction of the drainage.

The flark zones have an overgrowth of clumps of grass, sparse stunted tamarack, and low bush cranberry growing on a thin moss carpet.

Fringing the flark zone are open grassy areas or open spruce areas growing on sphagnum.

The intervening areas are covered by spruce trees with varying growth densities and heights as outlined on the accompanying airphoto. The undergrowth in the areas of taller trees consists of labrador tea and some grass growing on sphagnum.

Outcrops of granite were observed along the southern margin of the central part and on one of the spruce islands in the central part.

Depth

The depth of the deposit where sampled varies from 1.5 to 5.95 m and averages in excess of 3.6 m. At sites 5, 6, and 7 bottom was not reached due to lack of extension rods. Additional rods were obtained and bottom was reached at 5.95 m at site 8. At site 9 bottom could not be reached due to a root matt at 3.5 m.

Nature of Peat

An area of 55 ha of horticultural grade sphagnum has been partially delimited by four test holes in the west-central part of the bog. The depth of the sphagnum varies from 1.7 to 3.5 m and averages 2.7 m. This area is underlain by peat resting on a clay bottom. There are insufficient data to determine the thickness of the peat in this sector but it probably varies from 2.45 to over 3 m.

The sphagnum is light brown, medium fibred and elastic. Minor humified lenses at site 6, (0.45 to 3.0 m)

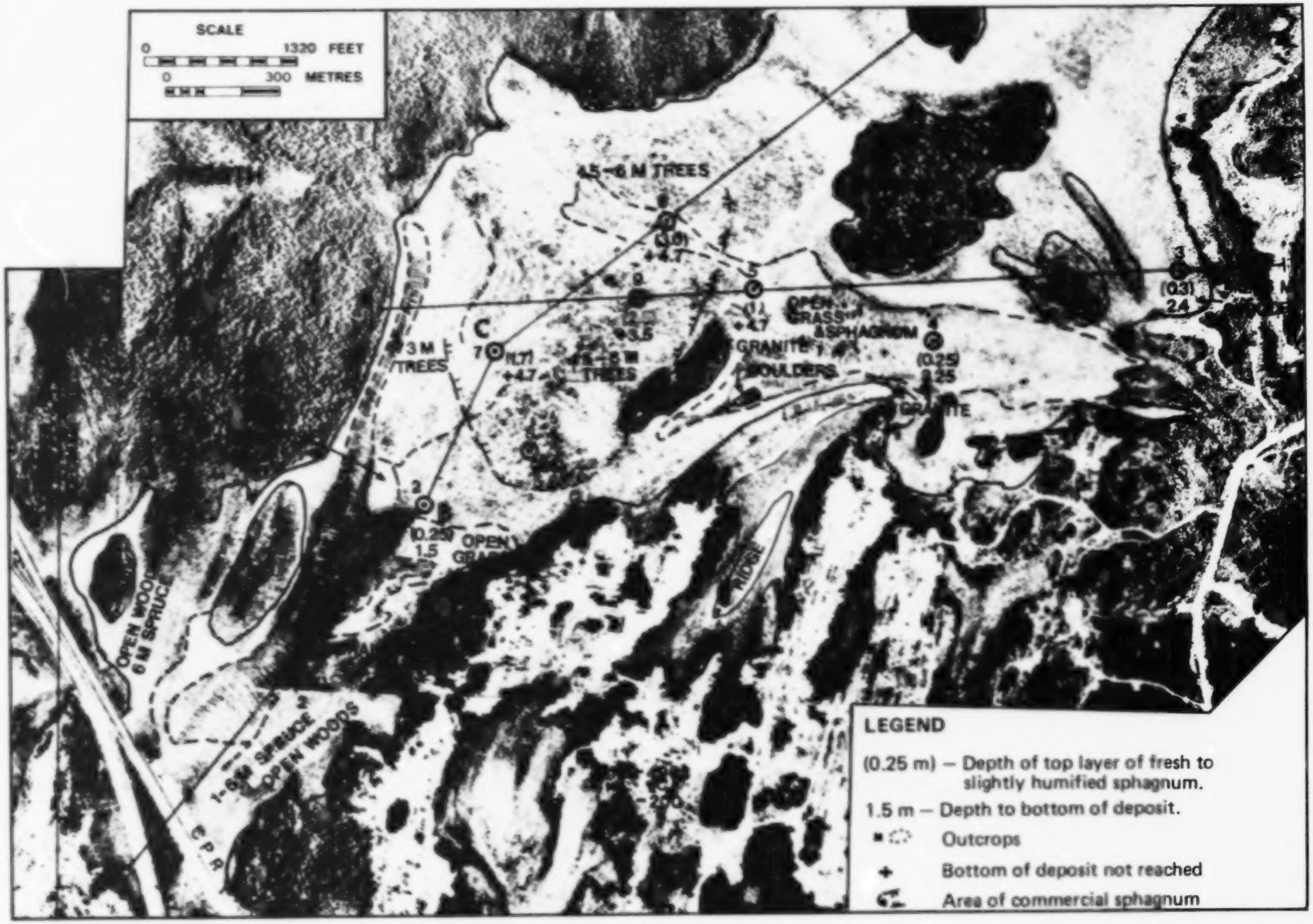

SCALE
0
1320 FEET
0
300 METRES
4.5–6 M TREES
(3.0)
+4.7
(2.0)
+3.5
(1.1)
+4.7
OPEN GRASS & SPHAGNUM
GRANITE
BOULDERS
(0.25)
3.25
GRANITE
3
(0.3)
2.4
C
7
(1.7)
+4.7
4.5–6 M TREES
3 M TREES
2
(0.25)
1.5
OPEN GRASS
RIDGE
OPEN WOODS 6 M SPRUCE
1–6 M SPRUCE OPEN WOODS
C P R
LEGEND
(0.25 m) – Depth of top layer of fresh to slightly humified sphagnum.
1.5 m – Depth to bottom of deposit.
Outcrops
Bottom of deposit not reached
Area of commercial sphagnum

Photo 28–Air photograph. Deposit 24: Stedman Township

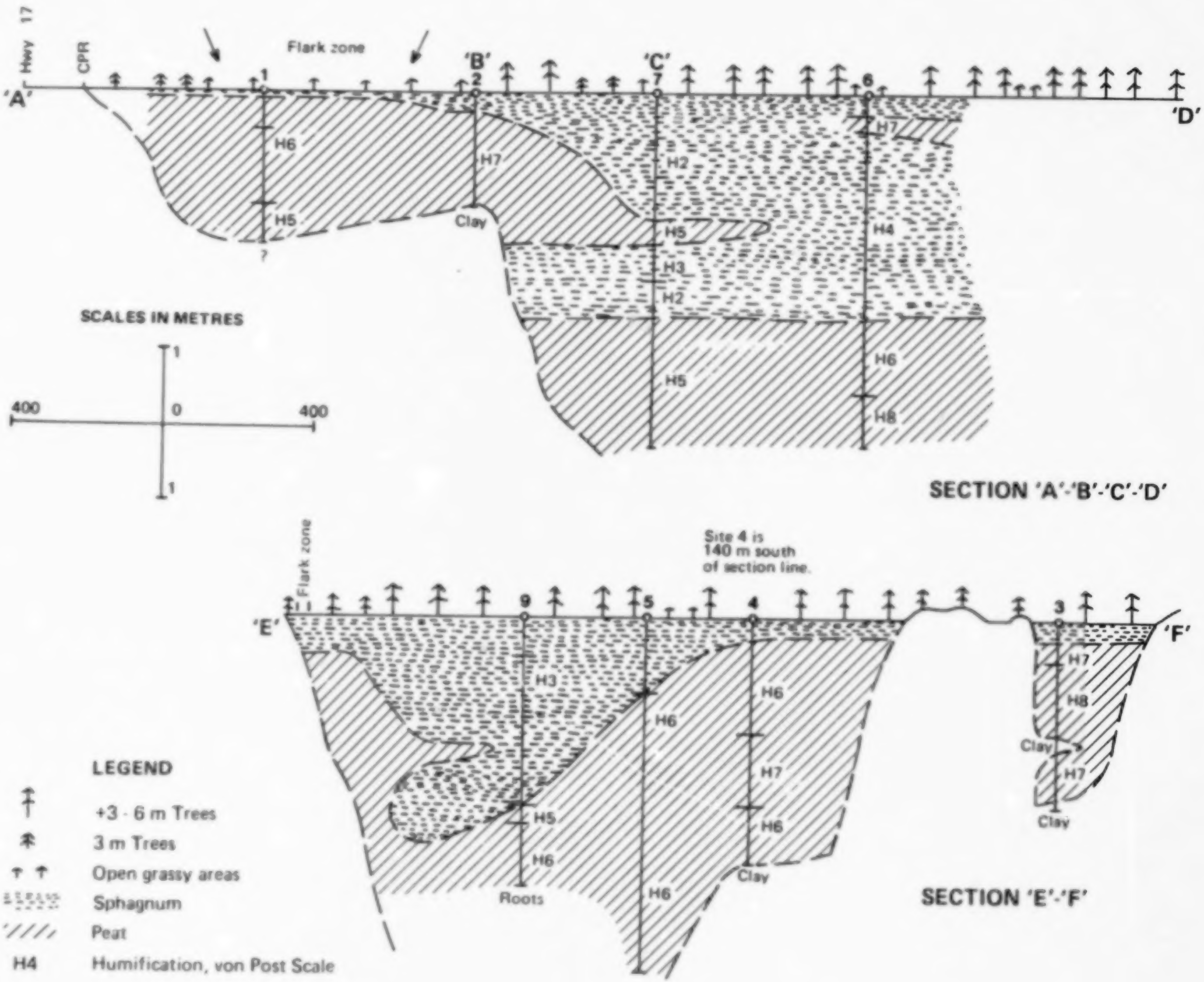

Hwy 17
CPR
'A'
Flark zone
'B'
'C'
'D'
1
2
7
6
H6
H5
?
H7
Clay
H2
H5
H3
H2
H5
H7
H4
H6
H8
SCALES IN METRES
400
0
400
1
1
SECTION 'A'-'B'-'C'-'D'
Site 4 is
140 m south
of section line.
Flark zone
'E'
'F'
9
5
4
3
H3
H5
H6
Roots
H6
H6
H6
H7
H6
Clay
H7
H8
Clay
H7
Clay
SECTION 'E'-'F'
LEGEND
+3 - 6 m Trees
3 m Trees
Open grassy areas
Sphagnum
Peat
H4
Humification, von Post Scale

Figure 20–Cross sections, location shown on Photo 28, Deposit 24: Stedman Township. (1978)

and at site 8, (3.0 to 3.5 m) would result in a dustier product than elsewhere. The absorption varies from 10.11 to 14.28, the ash from 2.26 to 4.35 percent, and the water content in the natural state from 92 to 94 percent with an average of 93 percent.

Surrounding the area of horticultural grade moss, the sphagnum layer is from 0.25 to 1.0 m thick resting on 1.25 to 3.7 m of peat. The average thickness of the peat is 2.28 m.

The peat is fine textured and the humification varies from H5 to H8 but is mostly H7. The main characteristics are tabulated below.

The ash content excludes anomalously high values of 34.8 percent at site 2, 0.25 to 1.5 m and of 33.6 percent at site 4, 2.5 to 3.5 m.

Drainage

There do not appear to be any drainage problems associated with this deposit. The drop in elevation into the Stedman River 600 m east of the bog appears adequate although this would require confirmation by elevations. The ditching required here is limited. In addition, existing ditches are present along the railway at the southern end of the bog and extend southward These ditches also drain into the Stedman River.

Comments

Additional sampling wil be required to determine accurately the reserves of horticultural grade peat moss. The preliminary data indicate that the thickness and area are sufficient to support a small operation.

The tree cover and accompanying roots will result in higher than normal preparation and production costs. This factor should be carefully studied before production is considered.

This deposit is 3 miles southeast of Deposit 29: Meinzinger Township which adjoins Deposit 25: Trewartha Township. These three as a group are sufficiently large to represent a potential source of fuel peat. However, detailed sampling and a topographic survey would be required to confirm this potential.

Access is convenient and three-phase electrical power is available at Upsala. Upsala is a pulp-cutting and gas pipeline base.

	Range	Average
Water percent	77-93	90.16
Ash Dry percent	6.25-13.4	10.14
Wet Vol. Dry Wt. gm/cc	0.08-0.14	0.11
Cal. Val. Kcal/Kgm	2726-5768	4571
S percent	.09-.25	.18
P percent	.04-.07	.05

DEPOSIT 25: TREWARTHA TOWNSHIP

Location

The Trewartha deposit is located in the west-central part of the township. The City of Thunder Bay lies 140 km to the southeast. Deposit 29 in Meinzinger Township is connected with the Trewartha deposit at the southeastern end.

Access

The Canadian Pacific Railway passes along the south edge and Highway 17 parallels the railway 140 to 600 m to the south. The road leading north from Highway 17 to Graham on the Canadian National Railways lies 1.3 km to the west.

Access for the field work was by the secondary road at the gravel pit on Highway 17, 1.6 km west of Baker Creek and from the cart trail leading north from Highway 17, 6 km west of Baker Creek.

Area

This irregularly shaped large open deposit has an area of about 1 500 ha.

Surface

The surface of the deposit consists of a hummocky sphagnum carpet with associated ledum, liverwort, and grass. In the flark and adjoining areas the surface is saturated and unstable to "floating". Here, the sphagnum is associated with eriophorum and pitcher plants. In the southwestern part there is a dried up lake extending 1.6 km in a northeast direction and averaging 600 m in width.

There are some islands of dense spruce growth in the open bog along with strandlines of spruce which average 3 to 4.5 m in height. Adjacent to the flark areas there is minor scattered spruce and tamarack 0.5 to 1 m high.

Depth

The average depth as determined from 28 sample sites is in excess of 2.9 m since at a few locations bottom could not be reached due to roots or very compact peat.

The deepest part of the deposit is in the northeastern part and extends south along the eastern flark zone. A maximum depth of 5 m was obtained in the northeastern corner at site 23 where the sampler bottomed in compact peat.

Nature of Peat

Two areas of sphagnum moss of sufficient depth to be of potential commercial interest are present. The larger of the two occurs in the northwestern corner at sites 21 and 23. Site 19 is also included. No moss was recovered to a depth of 1.5 m at site 19 but the underlying material has an absorptive value of 11.2 and a wet volume dry weight of 0.08 gm/cc. These values approach those characteristics of horticultural grade sphagnum. At site 21 sphagnum moss extends to a depth of 2 m and at site 23 to a depth of 1.7 m.

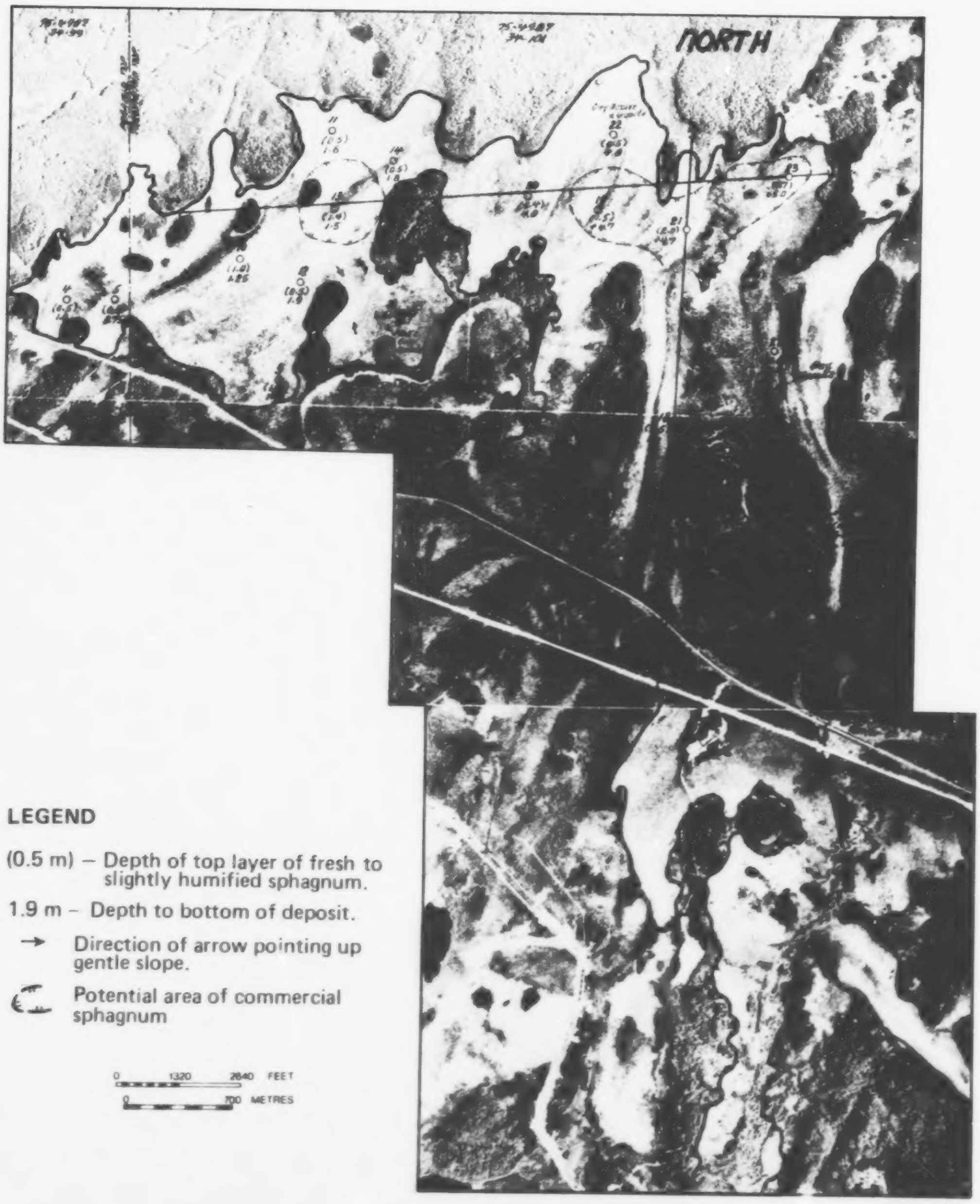
The second area is at site 13 where the sphagnum attains a thickness of 1.2 to 1.4 m although the last 0.2 m might be too dusty and heavy to be of commercial interest.

Other possible sphagnum areas are at sites 16, 18, and 25. At sites 16 and 25 no sample was recovered to depths of 1.7 and 1.5 m respectively due to the presence of considerable excess water. Under these conditions sphagnum moss is difficult to recover but this is not characteristic of peat. At site 18 fresh moss was recovered to a depth of 1.0 m. From 1.0 to 3.5 m sampling was again hindered by much excess water and an admixture of peat and fresh sphagnum was recovered . The dried sample was elastic but had low absorption due to the admixed peat.

The sphagnum is light brown and elastic. It has a wet volume dry weight of 0.07 gm/cc, a dry absorption of from 12.4 to 13.1 and an ash content from 5.1 to 5.2 percent. The water content in the natural state varies from 92.5 to 95.1 percent. The sphagnum areas are underlain by 0.6 to 3.3 m of peat.

Elsewhere the surface sphagnum layer varies from 0.2 to 1.0 m in thickness and overlies an average of more than 2 m of peat. The peat rests on greyish black to dark grey sandy clay with local pebbly areas. The peat is more variable than that encountered in the other deposits examined, the humification ranging from H5 to H9. The main characteristics of the peat are tabulated below.

	Range	Average
Water percent	63-95.1	87.8
Ash Dry percent	1.3-15.9	6.8
Wet Vol. Dry Wt. gm/cc	0.07-0.18	0.11
Cal. Val. Kcal/Kgm	2360-5562	4753
S percent	.11-.25	.14
P percent	.03-.1	.05


NORTH
0 1320 2640 FEET
0 700 METRES

LEGEND

(0.5 m) – Depth of top layer of fresh to slightly humified sphagnum.

1.9 m – Depth to bottom of deposit.

→ Direction of arrow pointing up gentle slope.

Potential area of commercial sphagnum

Photo 29–Air photograph, Deposit 25: Trewartha Township

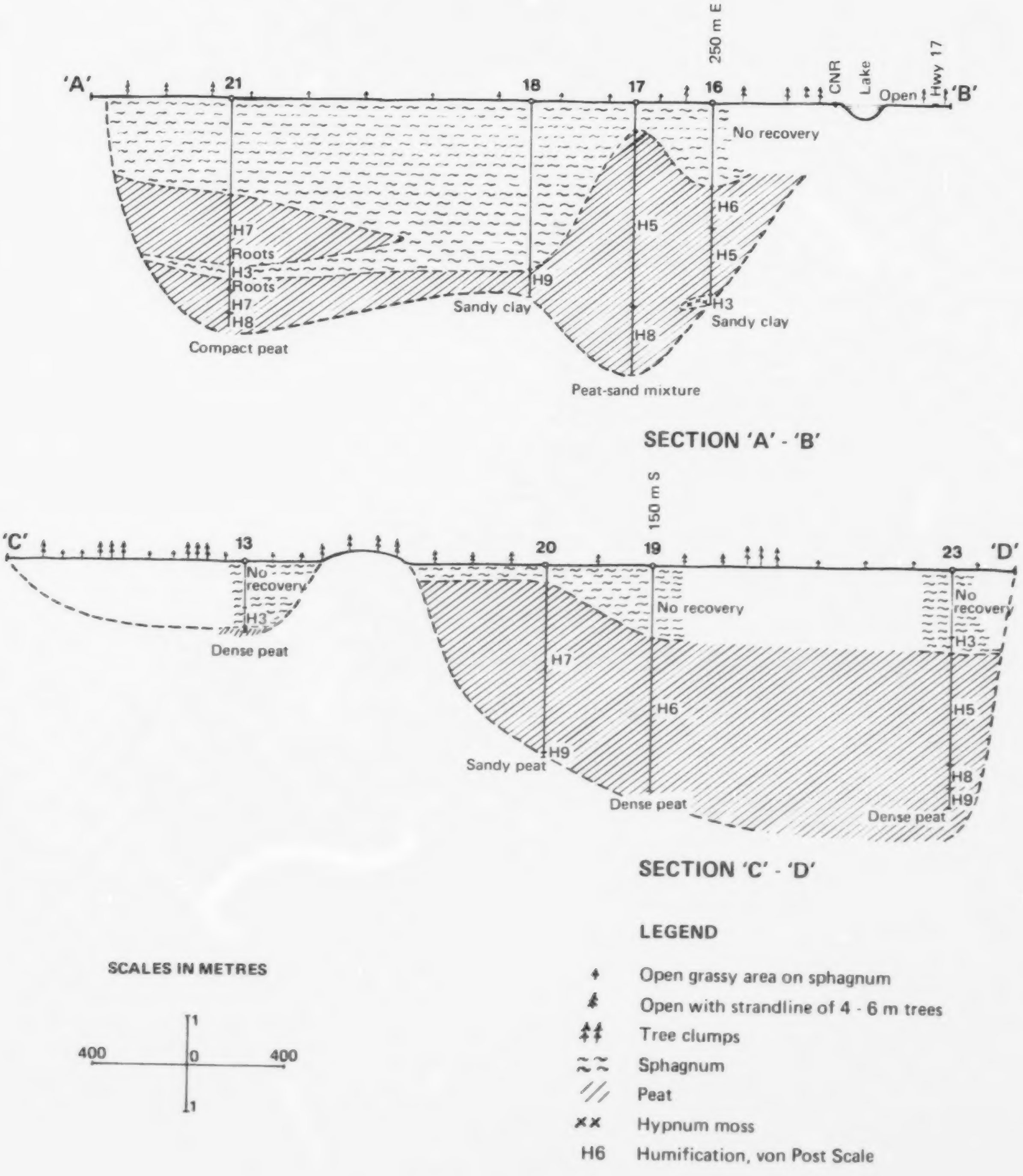

'A'
21
18
17
16
250 m E
CNR
Lake
Open
Hwy 17
'B'
No recovery
H7
Roots
H3
Roots
H7
H8
Compact peat
H9
Sandy clay
H5
H8
Peat-sand mixture
H6
H5
H3
Sandy clay
SECTION 'A' - 'B'
'C'
13
No recovery
H3
Dense peat
150 m S
20
19
23
'D'
No recovery
H7
H9
Sandy peat
H6
Dense peat
No recovery
H3
H5
H8
H9
Dense peat
SECTION 'C' - 'D'
SCALES IN METRES
1
400
0
400
1
LEGEND
Open grassy area on sphagnum
Open with strandline of 4 - 6 m trees
Tree clumps
Sphagnum
Peat
Hypnum moss
H6 Humification, von Post Scale

Figure 21–Cross sections, location shown on Photo 29, Deposit 25: Trewartha Township (1978).

The analyses reported three anomalously high ash values of 42.6, 44.7, and 82.0 percent, respectively. These were excluded from the average.

Drainage

The nearest well defined drainage system is the Firesteel River, 9.2 km to the south. Baker Creek flows out of the deposit at the southwestern end into the Firesteel River via Trewartha Lake, 3.2 km to the south. The creek has been ditched for 800 m south from the deposit to facilitate drainage of the railway. Ditches also extend south from the western end and from the central part.

Elevations would be required over a broad area south of the deposit in order to determine the most efficient drainage route.

Flark zones in the western part indicate southwestward internal drainage towards the ditched area. Pronounced southward drainage from an inlet at the northeastern end is indicated by a broad flark zone at this locality. The flark zone drains diffusely to the south into Baker Creek.

Comments

Additional sampling will be required to accurately determine the reserves of horticultural grade peat moss present. The preliminary data indicate that the thickness and area are sufficient to support a commercial operation. However, the sphagnum present has a shorter fibre length than that occurring in most commercial deposits, consequently the product would be dustier and heavier than that generally produced.

This deposit represents a substantial source of peat in conjunction with the adjoining Deposit 29 in Meinzinger Township and Deposit 24 in Stedman Township.

The Trewartha deposit's freedom from tree growth, large area, and easy access are factors favouring its development. More detailed sampling, drainage studies, quality tests, and economic studies are required to provide a proper assessment both with respect to reserves and to development of these two deposits.

Three-phase electric power is available at Upsala 20 km by road to the east. Upsala is a pulp-cutting and gas pipeline base. The gas pipeline passes 1.2 km south of the southwestern end of the deposits.

DEPOSIT 27: McNEVIN TOWNSHIP

Location

This deposit is situated in the southeastern corner of McNevin Township and extends into Corman Township just north of Lower Scotch Lake.

Access

Highway 17 and the Canadian Pacific Railway pass along the northern side. A gravel road leading south from Martin on Highway 17 provides access to the western part of the bog. A gravel road extending south from Highway 17 a short distance to the east of the deposit provides access to the eastern part.

Area

The area selected comprises some 940 ha. It extends to the east for 6.4 km and averages about 1.6 km in width.

Surface

The surface is saturated and hummocky with grass and ledum shrubs growing on sphagnum moss. The surface is unstable in and near the flark areas as is an area in the vicinity of site 3 which is 3200 m southeast of the lake in the most northern part of the deposit.

The eastern and western parts are open except for sparse, scattered tamarack trees 0.6 to 2.4 m high. Elsewhere there is an overgrowth of spruce and some tamarack 1.2 to 2 m high with a growth density of 4.5 to 6 m. Strandlines of denser taller trees averaging 2.4 to 3 m in height are also present.

Depth

The average depth as determined from 20 sample sites is in excess of 2.1 m. The maximum depth obtained was 3.4 m at site 14 in the east-central part.

Nature of Peat

The surface layer of fresh sphagnum varies from 0.3 to 1.3 in thickness. At site 11, the sample collected from a depth of 0.5 to 1.2 m has a dry absorption value of 8.5 and a wet volume dry weight of 0.10 gm/cc, indicating peat but the physical appearance of the sample collected is that of horticultural grade sphagnum.

It is inferred at adjacent site 1 which is 670 m to the southwest, that 1.3 m of horticultural grade moss could be present although no sample was recovered. This is a characteristic of fresh sphagnum. The area between sites 1 and 11 is regarded as a potential area of horticultural grade sphagnum although detailed sampling would be required to confirm this.

The moss rests on a dark brown fibrous peat. The humification of the peat is mainly in the H5 to H7 range although H4 and H8 to H10 peat is also present. The peat rests on a clay to sandy clay bottom.

The main characteristics of the peat from Deposit 27 are tabulated below.

The average ash content excludes anomalously high values of the bottom samples at sites 13, 16, 19, and 20. Values obtained from these samples were respectively 80.6, 24, 20.4, and 75 percent. These high values are due to admixed clay.

Drainage

Drainage would most easily be achieved by ditching south for 800 to 1200 m into Lower Scotch Lake. The elevation of Lower Scotch Lake would be required to determine if the drop is adequate. A creek flowing into the lake passes by the southwest end of the deposit. Flark zones in the southwestern part indicate internal drainage south along the west side and into the above mentioned creek.

Comments

The indicated area of horticultural grade moss would require detailed sampling to determine if reserves are sufficient to support a commercial operation.

The fuel peat potential could supply a small generating plant of 10 to 12 MW.

The open nature of the deposit and its accessibility are factors favouring development.

	Range	Average
Water percent	79.9-94.9	90.5
Ash Dry percent	2.4-19.9	7
Wet Vol. Dry Wt. gm/cc	.07-.23	.01
Cal. Val. Kcal/Kgm	2667-5507	4702
S percent	.1-.23	.17
P percent	.05-.08	.052

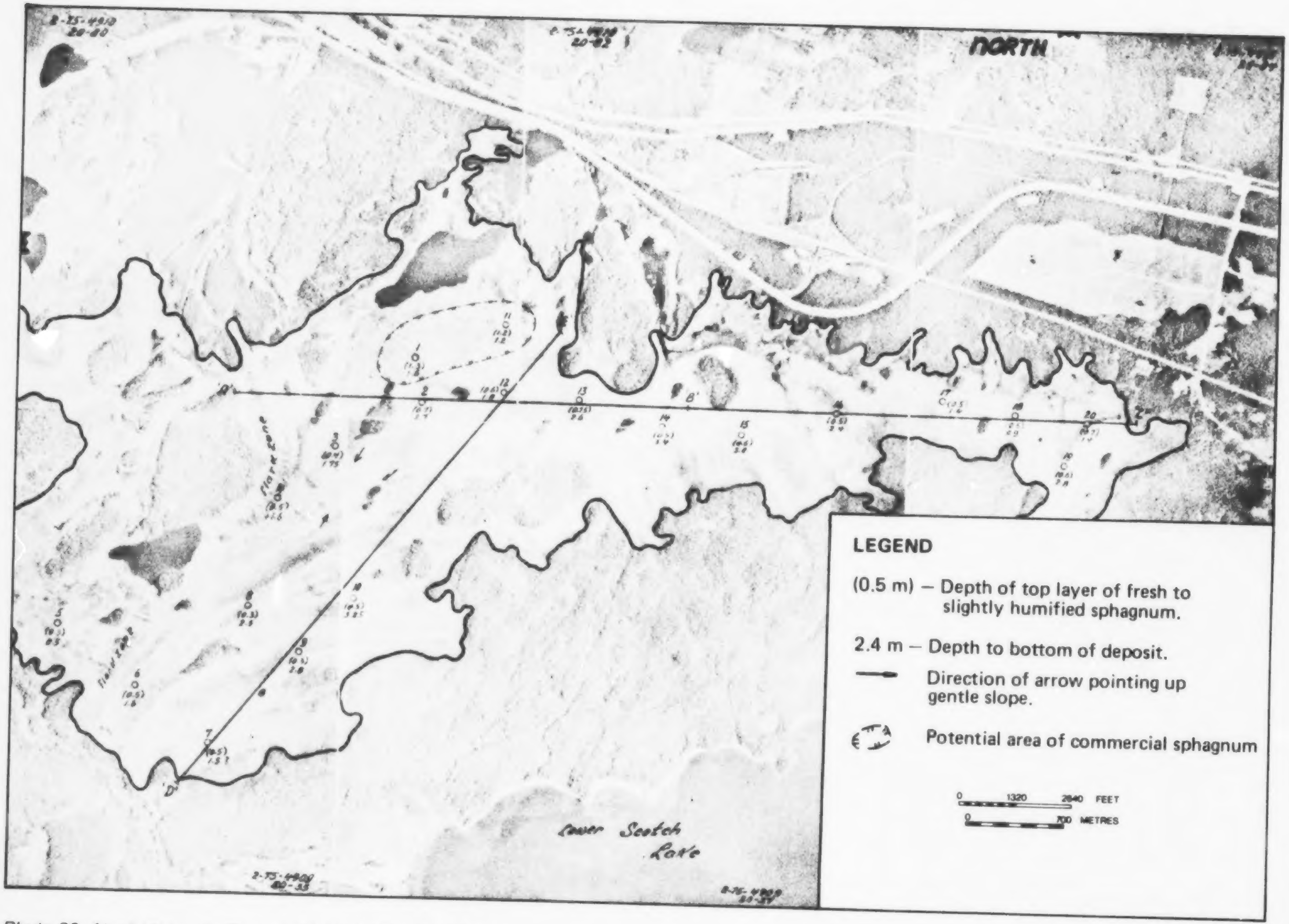

NORTH
Lower Scotch Lake
LEGEND
(0.5 m) – Depth of top layer of fresh to slightly humified sphagnum.
2.4 m – Depth to bottom of deposit.
Direction of arrow pointing up gentle slope.
Potential area of commercial sphagnum
0 1320 2640 FEET
0 700 METRES

Photo 30–Air photograph, Deposit 27: McNevin Township

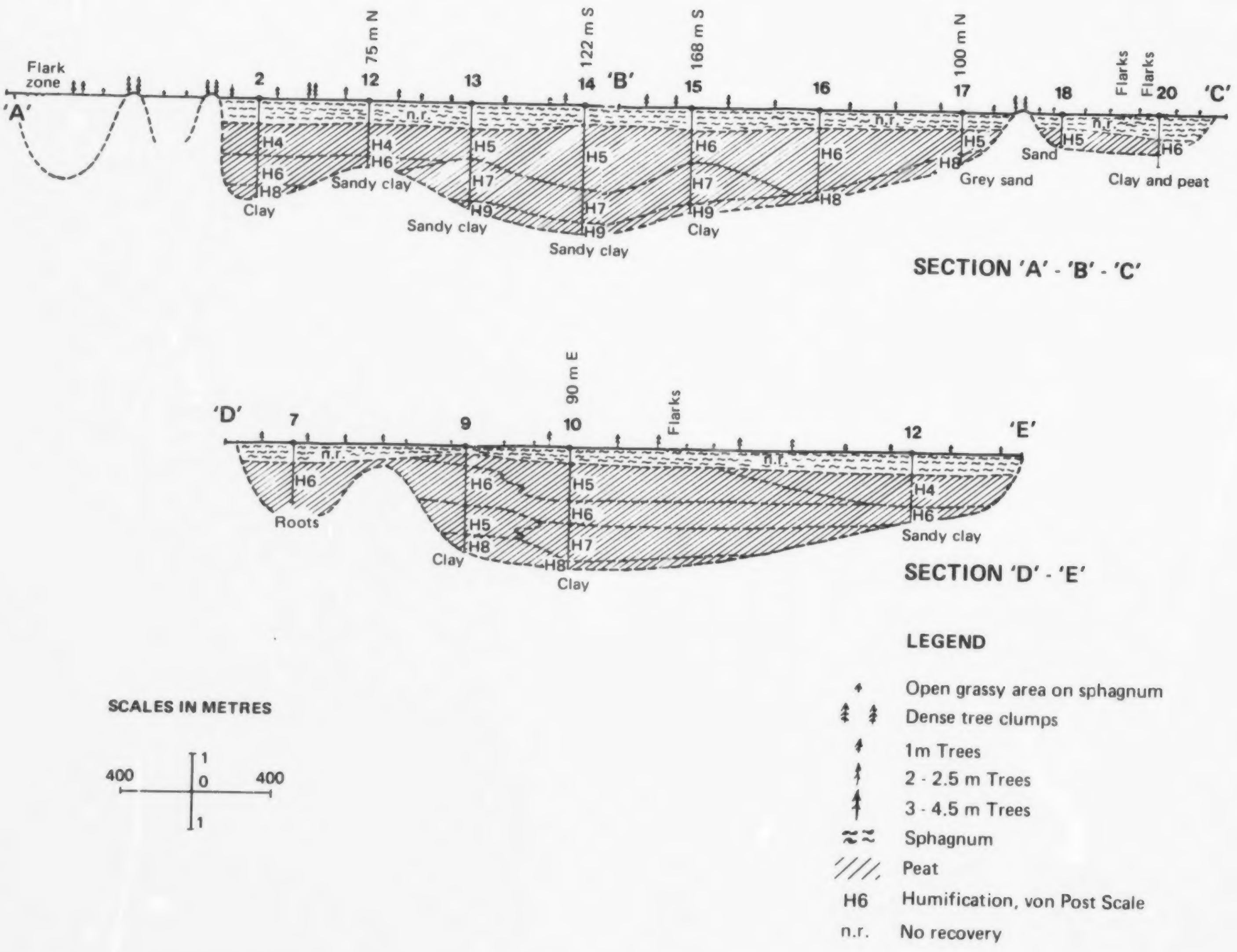

Flark zone
'A'
2
12
75 m N
13
14 'B'
122 m S
15
168 m S
16
17
100 m N
18
Flarks
Flarks
20
'C'
n.r.
H4
H6
H8
H5
H7
H9
Clay
Sandy clay
Grey sand
Sand
Clay and peat
SECTION 'A' - 'B' - 'C'
'D'
7
9
10
90 m E
Flarks
12
'E'
Roots
SECTION 'D' - 'E'
SCALES IN METRES
400
0
1
LEGEND
Open grassy area on sphagnum
Dense tree clumps
1m Trees
2 - 2.5 m Trees
3 - 4.5 m Trees
Sphagnum
Peat
H6 Humification, von Post Scale
n.r. No recovery

Figure 22–Cross sections, locations shown on Photo 30, Deposit 27: McNevin Township. (1978).

DEPOSIT 28: CATHCART TOWNSHIP

Location

This deposit is centred 6.8 km east and 2 km south of the northwest corner of the township. The settlement of English River on Highway 17 lies 25.5 km to the east and the City of Thunder Bay 174 km to the southeast.

Access

The Cathcart deposit is easily reached on foot from Highway 17, 150 m to the north. The Canadian Pacific Railway lies 4 km to the north.

Area

The area containing the least trees consists of 105 ha within a large muskeg area with a varying density of tree growth. The area selected extends 1800 m in an east-west direction and averages 900 m in width.

Surface

This deposit has an area in the central part 1300 m long and averaging 180 m in width, containing a few scattered spruce 0.5 to 1 m high growing on grass and sphagnum. The surface is relatively even with clumps of labrador tea up to 0.3 m high. The open area is fringed with scattered spruce up to 1.8 m high and 2 to 5 cm thick at the stump growing on the average 10 to 12 m apart on a sphagnum labrador tea carpet. The extreme southern part supports a tree growth up to 4.5 m high growing at 5 to 10 m intervals.

A hair-like submerged drainage channel crossing westward through the open part of the bog is visible on the airphoto but not on the ground. It extends into the Gulliver River.

Depth

The depth, where sampled, varies from 1.25 to 1.75 m. The sampler could not penetrate past 1 m at site 1, because of very compact material, either peat or clay and past 1.75 m at site 4 because of very compact peat.

Nature of Peat

The surface layer of fresh sphagnum is 0.5 m thick. It rests on a dark brown relatively uniformly humified peat with an ash content of 4.41 to 9.89 percent. The bottom samples from sites 1 and 2 have anomalously high ash contents of 44.2 and 39.3 percent, possibly due to contamination from the underlying clay.

At site 3 a lens of relatively unhumified sphagnum was encountered from 0.75 to 1.0 m. This is of local extent.

The moisture content of the peat varies from 77 to 91 percent and averages 84.5 percent.

Drainage

The submerged drainage channel could be extended by ditching 300 m into the Gulliver River. Levels would be required to determine if the drop in elevation is sufficient to permit adequate drainage.

Comments

There is insufficient sphagnum moss present to be of commercial interest. Whereas the peat present is relatively uniform, its thickness is limited to between 0.75 and 1.25 m and consequently does not represent a significant potential source of peat.

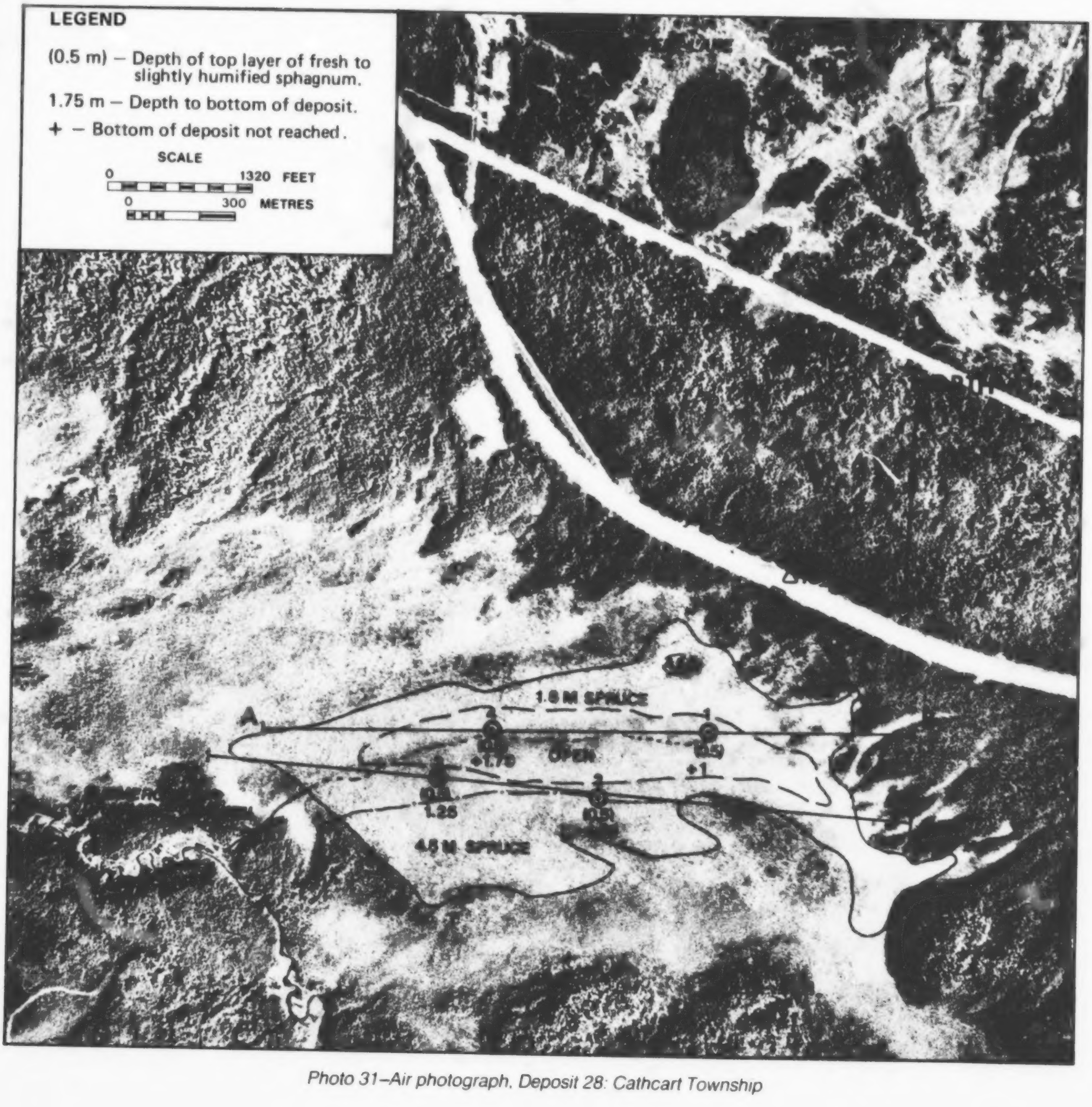

LEGEND
(0.5 m) – Depth of top layer of fresh to slightly humified sphagnum.
1.75 m – Depth to bottom of deposit.
+ – Bottom of deposit not reached.
SCALE
0
1320 FEET
0
300 METRES
1.8 M SPRUCE
A
2
1
+1.75
OPEN
(0.5)
+1
2
1.25
(0.5)
4.5 M SPRUCE

Photo 31–Air photograph, Deposit 28: Cathcart Township

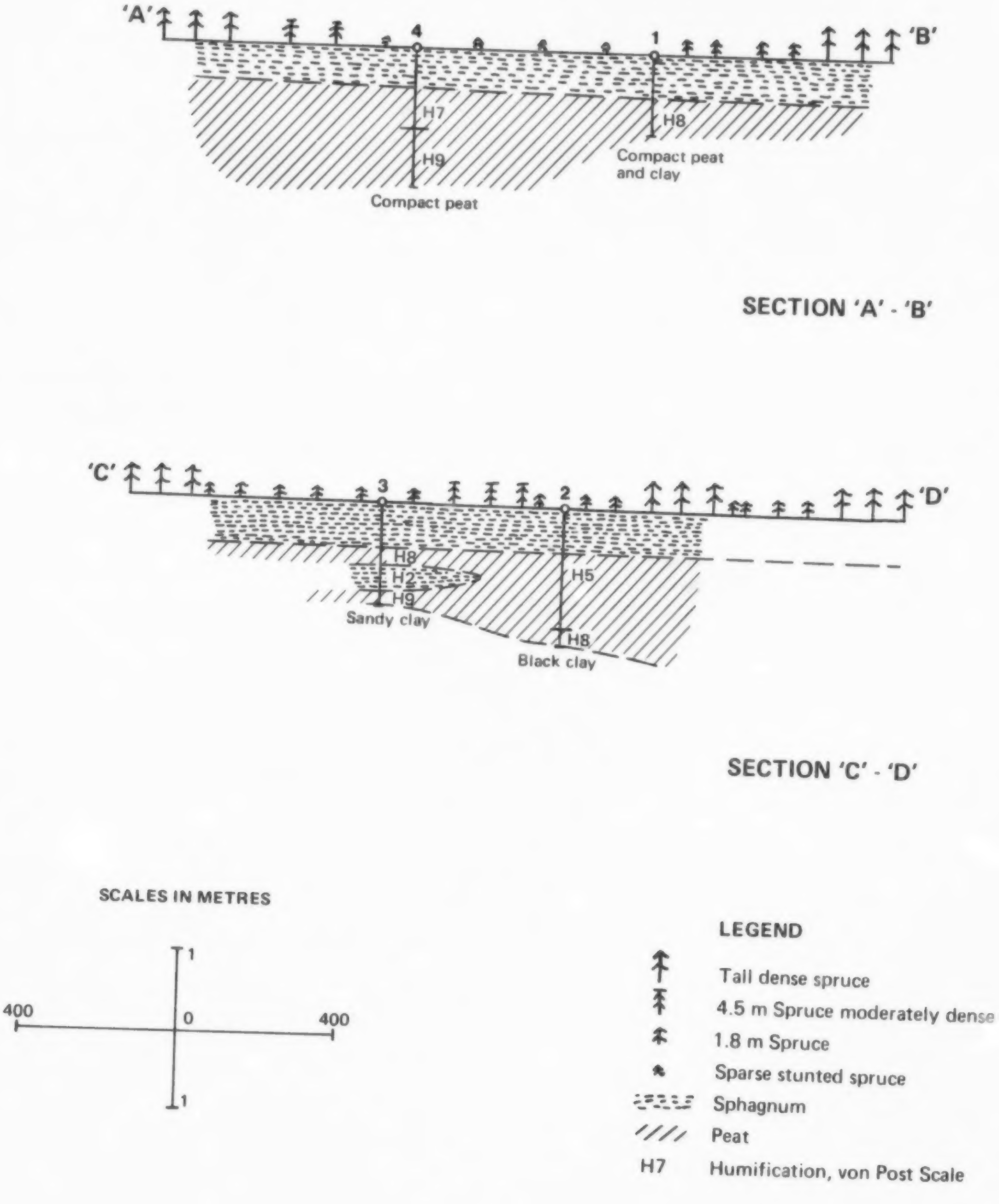

'A'
4
1
'B'
H7
H9
H8
Compact peat
Compact peat and clay
SECTION 'A' - 'B'
'C'
3
2
'D'
H8
H2
H9
H5
H8
Sandy clay
Black clay
SECTION 'C' - 'D'
SCALES IN METRES
1
400
0
400
1
LEGEND
Tall dense spruce
4.5 m Spruce moderately dense
1.8 m Spruce
Sparse stunted spruce
Sphagnum
Peat
H7 Humification, von Post Scale

Figure 23–Cross sections, location shown on Photo 3I, Deposit 28: Cathcart Township. (1978).

DEPOSIT 29: MEINZINGER TOWNSHIP

Location

The Meinzinger deposit occupies the western half of the township and extends beyond the township limits for 3 km to the north and 4.4 km to the south. The settlement of Graham on the Canadian National Railways lies 7.2 km to the northeast The City Thunder Bay lies 114 km to the southeast.

Access

The road to Graham leaves Highway 17, 14 km west of Upsala and passes 1.2 to 6.4 km west of the deposit. A road extending west from Graham passes 0.8 km to the north. Highway 17 and the Canadian Pacific Railway cross the southwest end.

Area

The Meinzinger deposit is the largest bog examined and is connected with Deposit 25: Trewartha Township at its southwest end. It comprises an area of some 3850 ha of which 2050 ha in the southern part were sampled at 10 sites.

Surface

The surface is undulating. The central part is saturated and supports a growth of eriophorum on a sphagnum carpet. Widely scattered tamarack and a few spruce averaging 0.3 m to 1 m in height are present.

To the northeast and southwest the surface is drier and is characterized by a hummocky sphagnum surface with labrador tea (ledum) and minor eriophorum. The drier area to the northwest in the vicinity of sites 8 and 9 has a sparse, 1 m tall tree growth. The area to the southwest between sites 3 and 4 is more forested with spruce trees averaging 3 m in height.

Depth

The average depth as determined from the sample sites is 2.29 m. The maximum depth of 4.3 m was obtained at site 6 in the southeastern part of the area surveyed.

Nature of Peat

The sphagnum surface layer is 0.2 to 0.5 m thick. The underlying peat is relatively uniform material with a von Post humification factor generally of H5 to H7.

The material underlying the peat varies from grey to black clay and sandy clay through brownish silty sand to light grey sand.

The ash content varies from 4.5 to 13.4 percent and averages 8.8 percent. The moisture content varies from 86.2 to 93.8 percent and averages 90.4 percent.

The main characteristics of the peat are tabulated below.

	Range	Average
Water percent	86.2-93.8	90.4
Ash Dry percent	4.6-13.4	8.8
Wet Vol. Dry Wt. gm/cc	.08-.13	.11
Cal. Val. Kcal/Kgm	2255-5611	4803
S percent	.1-.34	.19
P percent	.04-.07	.06

Drainage

This large deposit would require elevations over a broad area to assess the drainage requirements. Natural drainage is towards the southwest via Baker Creek and south into the Firesteel River 7 km distant. A creek also drains out of the south-central part into the Firesteel River. The estimated drop in elevation to the Firesteel River is about 15 m.

Internal drainage as indicated by flark zones is from the north into the south-central saturated part of the deposit.

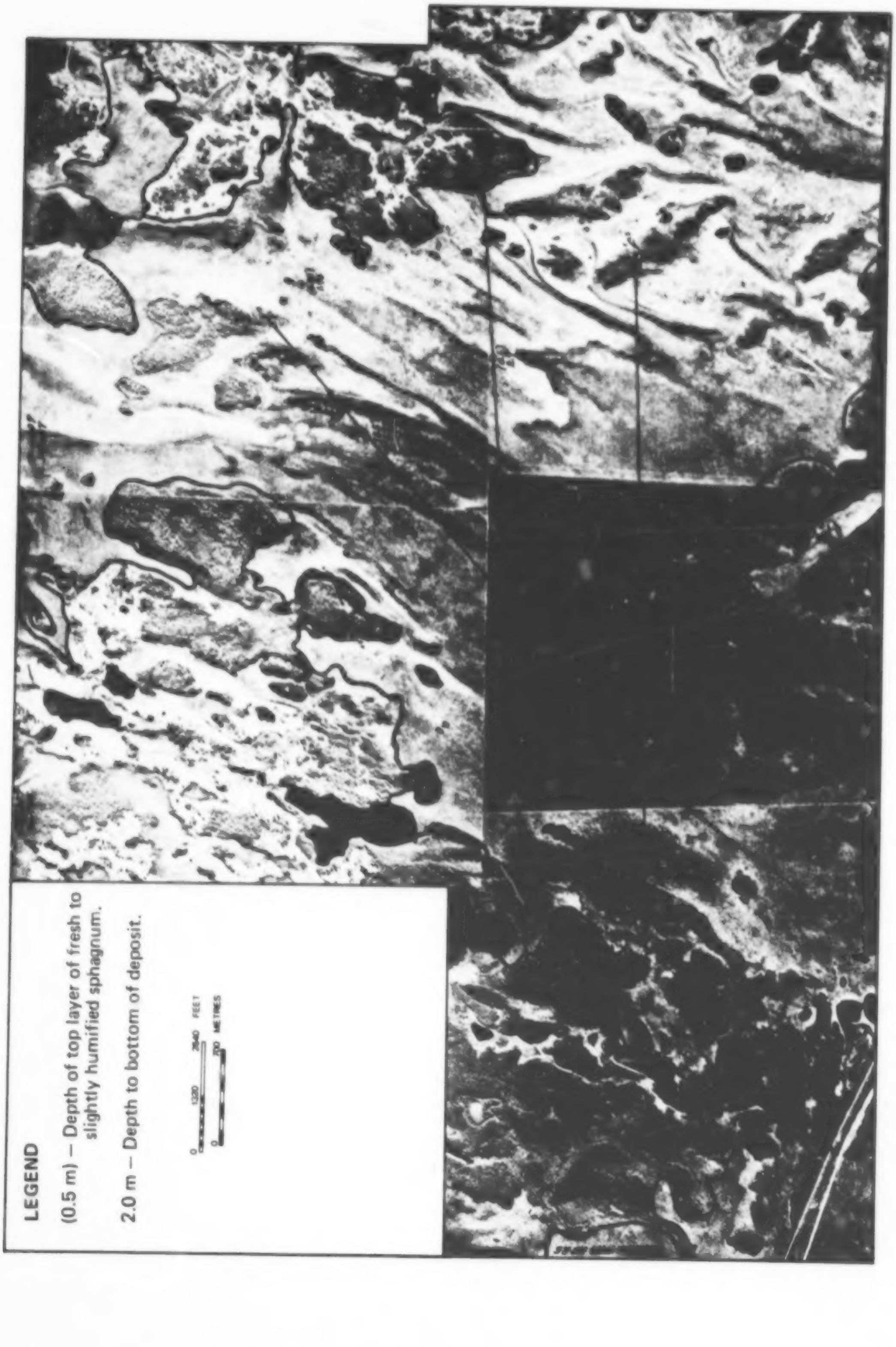
There are no visible creeks draining into the bog.

Comments

Approximately 53 percent of the total open area of the Meinzinger deposit was examined. Consequently the potential peat resource of this deposit presented in Table 5 is considerably less than the total potential. This deposit in conjunction with the adjoining Deposit 25 in Trewartha Township and Deposit 24 in Stedman Township, 5 km distant, represents the largest potential sources of peat fuel in the areas examined.

Roots were not encountered in the reconnaissance sampling. This, combined with its large open area and easy access, are factors favouring its development. More extensive and more detailed sampling, drainage studies, quality tests, and economic studies are required to provide a proper assessment both with respect to reserves and development.

Three-phase electric power is available at Upsala 19.4 km to the east. Upsala is a pulp-cutting centre and gas pipeline base. The gas pipeline passes 4 km south of the deposit.



LEGEND

(0.5 m) – Depth of top layer of fresh to slightly humified sphagnum.

2.0 m – Depth to bottom of deposit.

0
1320
2640 FEET
0
800 METRES

Photo 32–Air photograph, Deposit 29: Meinzinger Township

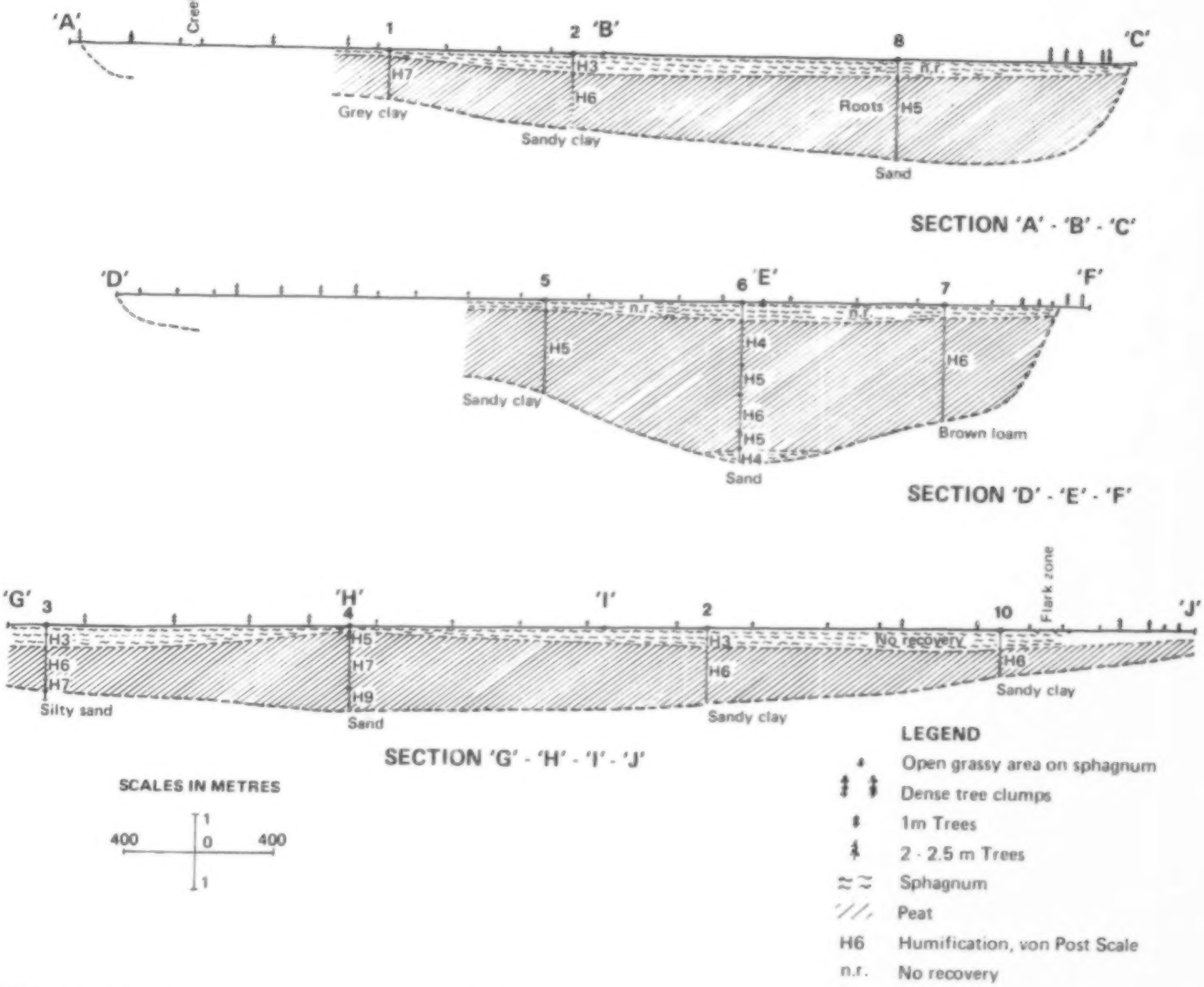

'A'
Creek
1
2 'B'
8
'C'
H7
H3
H6
n.r.
Roots
H5
Grey clay
Sandy clay
Sand
SECTION 'A' - 'B' - 'C'
'D'
5
6 'E'
7
'F'
n.r.
H5
H4
H5
H6
H5
H4
H6
Sandy clay
Sand
Brown loam
SECTION 'D' - 'E' - 'F'
'G' 3
'H' 4
'I'
2
10
'J'
Flark zone
H3
H6
H7
H5
H7
H9
H3
H6
No recovery
H6
Silty sand
Sand
Sandy clay
Sandy clay
SECTION 'G' - 'H' - 'I' - 'J'
SCALES IN METRES
400
0
400
1
1
LEGEND
Open grassy area on sphagnum
Dense tree clumps
1m Trees
2 - 2.5 m Trees
Sphagnum
Peat
H6 Humification, von Post Scale
n.r. No recovery

Figure 24–Cross sections, location shown on Photo 32, Deposit 29: Meinzinger Township (1978)

APPENDIX I: DESCRIPTIVE TABLES

Deposit 1: Springer Township

Sample Columns

Depth Metres		Dried Appearance and Laboratory Results
	Site 1	
0 - 0.3	Green sphagnum, many roots.	
0.3 - 0.6	Dark brown greasy peat. H8.	
	Site 2	
0 - 0.3	Green sphagnum.	
0.3 - 1.8	Medium brown moderately humified sphagnum becoming darker brown and more humified towards end of section.	
1.8 - 3.25	Dark brown greasy peat.	
3.25	Sand.	
	Site 3	
0 - 0.3	Green sphagnum.	
0.3 - 0.76	Light brown, slightly greasy. 35% sphagnum, 10% sedge and roots, 55% polytricum as thin layers, dry. H3.	
0.76 - 1.5	As above, but 50% humified. Pasty texture. H5.	
1:5 - 1.82	Dry pasty dark brown peat. H8.	
1.82	Point of rejection.	
	Site 4	
0 - 0.3	Green moss.	
0.3 - 0.76	Dark brown 50%. Humified sedge with much absorbed water. Greasy texture. H5.	
0.76 - 0.9	Pasty, 50% humified sphagnum. H6.	
0.9 - 1.2	Admixture of humified sphagnum, reeds, sedge, roots. H7.	
1.2	Point of rejection - roots.	
	Site 5	
0 - 0.45	Green sphagnum.	
0.45 - 1.1	Medium to light brown fibrous sphagnum, some thin humified layers. H2 to H3.	Medium brown, medium textured, elastic; a few humified patches. AD-9.0 VW-0.09 Ash-0.8
1.1 - 1.3	Transition to dark brown peat.	
1.3 - 1.8	Dark brown granular with fibre faintly preserved. H6.	Medium brown, fine to medium textured, 10% humified patches, elastic. AD-7.7 VW-0.09 Ash-2.5
1.8 - 2.3	Medium brown peat, fibrous texture visible. H5.	Fine textured and hard. Brownish black. AD-7.1 VW-0.09 Ash-1.5
2.3 - 3.25	As from 1.3-1.8. At 2.8 to 3 cm bed of felty sedge.	
3.25	Grey sandy clay.	
	Site 6	
0 - 0.7	Green sphagnum.	
0.7 - 0.9	Medium brown sphagnum, 30% reeds, comparatively dry. Many roots. 50% humified.	Dries to a fine textured hard and brittle product.
0.9 - 1.5	Dark brown granular peat with some residual fibre. Rooty. Becomes moister with depth. Some reeds.	0.9-2 Brittle, dark brown. AD-7.1 VW-0.11 Ash-8.0
1.5 - 2	As above, but no roots and still moister. Some reeds.	
2	Rejection due to numerous roots.	

Deposit 2: Loudon Township

	Site 1	
0 - 0.3	Grass, sedge, sphagnum admixture.	
0.3 - 1.52	Dark brown greasy to plastic peat. Nearly all fibre texture destroyed. H8.	

Depth Metres		Dried Appearance and Laboratory Results
	1.21 - 1.37 Moderately humified sedge layer. H5.	
1.52	Grey plastic clay.	
	Site 2	
0 - 0.3	Grass, sedge, sphagnum admixture.	
0.3 - 1.82	As at site 1, 0.3-1.52.	
1.82 - 2.13	Reed and sedge layer, fibres well preserved. H3.	
2.13	Grey plastic clay.	
	Site 3	
0 - 0.3	Grass, sedge, sphagnum admixture.	
0.3 - 0.76	Dark brown reed and sedge. Fine fibred. Some roots. H2 to H3.	
0.76 - 1.22	Dark brown humified reed and sedge. H6.	
1.22 - 1.83	Dark brown fine-fibred sedge with about 10% sphagnum and some reeds. H3.	
1.83 - 2.13	Dark brown humified reed and sedge. H6.	
2.13	Grey plastic clay.	
	Site 4	
0 - 0.6	Grass, sedge, sphagnum admixture.	
0.6 - 0.7	Mainly sphagnum with some sedge. Medium brown moderately humified. H3.	Medium brown, hard and brittle due to humified patches. Intervening material elastic - commercially marginal. AD-5.4 VW-0.11 Ash-3.8
0.7 - 1.5	Dark brown sedge, fibrous material preserved. H4.	Dark brown, fine textured, hard and brittle. AD-11.9 VW-0.08 Ash-4.8
1.5 - 1.75	Reed, grass and sedge. Light brown. H3.	As above, but more fibre. AD-8.4 VW-0.09 Ash-6.7
1.75 - 5.75	Soft saturated grey plastic clay.	
	Site 5	
0 - 0.3	Grass, sedge, sphagnum admixture.	
0.3 - 1.5	Medium brown granular to plastic peat containing 30% reeds and grass. H6.	Dark brown hard and brittle. AD-8.7 VW-0.11 Ash-6.2
1.5 - 1.75	Light brown fine-fibred sedge with 20% reeds and grass. H4.	Dark brown fine textured and elastic with 30% humified material. Would produce a dusty product. AD-13.7 VW-0.07 Ash-6.7
1.75	Point of rejection - rock.	
	Site 6	
0 - 0.5	Grass, sedge, sphagnum admixture.	
0.05 - 0.75	Unhumified sedge and grass.	
0.75 - 1.0	No sample.	
1.0 - 1.75	Semi-plastic peat with fine fibrous structure quite evident. 30% grass and reeds. H5.	Fine textured, brownish black, brittle and dusty. AD-10.8 VW-0.06 Ash-5.5
1.75 - 2.0	Medium brown fine-fibred somewhat humified sedge, 30% reeds and grass. H3.	Dark brown, fine textured and brittle. AD-6.4 VW-0.12 Ash-4.9
2.0	Bluish white clay.	

Deposit 3: Street Township

	Site 1	
0 - 0.3	Green sphagnum.	
0.3 - 0.75	Brown sphagnum with 25% rootlets and reeds, some sedge. H3.	Medium textured, medium brown and elastic. Sedge content could result in a dusty product. AD-8.9 VW-0.10 Ash-7.4
0.75 - 1.0	Humified sphagnum. Plastic fibrous texture faintly preserved. H8.	
1.0 - 1.3	As from 0.3-0.75 but no rootlets.	As for 0.3-0.75. AD-12.6 VW-0.06 Ash-7.1

Depth Metres		Dried Appearance and Laboratory Results
1.3 - 1.4	Grey plastic clay.	
	Site 2	
0 - 0.2	Green sphagnum.	
0.2 - 0.6	Medium brown matt of felty fibred sedge with 20% reeds and 10% roots. H4.	40% humified. Dark brown, fine textured, brittle. AD-12.3 VW-0.06 Ash-5.3
0.6 - 1.5	As above but greasy and plastic with 20% reeds and roots. H5.	As above. AD-10.8 VW-0.08 Ash-4.3
1.5 - 2.8	Humified plastic peat with faint preservation of fibre. 20% reeds. H8.	Dark brown, fine textured and brittle. AD-8.0 VW-0.09 Ash-28.0
2.8 - 2.85	Clay-peat mixture.	
	Site 3	
0 - 0.2	Sphagnum, some sedge.	
0.2 - 1.3	Medium brown moderately humified sphagnum, with 15% reeds and rootlets. H4.	Medium brown, medium textured elastic sphagnum. AD-12.2 VW-0.06 Ash-8.2
1.3 - 2.0	Plastic peat, slightly granular. Faint fibrous texture preserved. 10% reeds and rootlets.	Dark brown. 30% reeds, remainder humified. Fine textured and brittle. AD-7.1 VW-0.06 Ash-9.8
2.0	Clay.	

Deposit 4: Street Township

	Site 1	
0 - 0.15	Green moss.	
0.15 - 0.76	Dark brown plastic peat.	
0.76 - 1.52	Lighter brown plastic peat. No residual fibres.	
1.52	Point of rejection.	
	Site 2	
0 - 0.15	Green moss.	
0.15 - 0.76	Medium brown sedge. H3.	
0.76 - 0.91	Reddish brown, 60% fine sphagnum and 40% sedge. Somewhat humified. H3.	
0.91 - 1.21	As above, but darker brown and slightly greasy. H5.	
1.21 - 2.74	Dark brown plastic peat. No residual fibre.	
2.74	Grey sandy clay.	
	Site 3	
	Identical to Site 2. Bottomed in hard compact peat instead of clay.	
	Site 4	
0 - 0.2	Green moss.	
0.2 - 1.7	Medium brown fibrous sedge somewhat humified, 10% reeds. H3.	Fine textured, hard and brittle. AD-6.5 VW-.11 Ash-2.8
1.7 - 2	Medium brown 20% rootlets and fine sedge fibre. Remainder humified. H8.	Fine textured, brownish black, hard and brittle. AD-10 VW-.04 Ash-2.7
2 - 2.25	Plastic peat, fibrous texture preserved. 30% reeds.	Brownish black, fine textured and brittle. AD-8.5 VW-.07 Ash-6.1
2.25	Clay.	
	Site 5	
0 - 0.1	Green moss.	
0.1 - 0.3	Medium brown sphagnum. H4.	Light brown, medium textured elastic sphagnum with 20% fine tendrils and rootlets. Commercial quality. AD-10.6 VW-.08 Ash-3.3
0.3 - 0.5	No recovery.	
0.5 - 1.5	Medium brown, somewhat humified fine sedge, rooty. H4.	30% sedge, 20% reeds, remainder humified material. Dark brown fine textured and brittle. AD-15.6 VW-.08 Ash-1.8

Depth Metres		Dried Appearance and Laboratory Results
1.5 - 2.5	Dark brown plastic peat, somewhat granular. Fibrous texture still visible. H7.	As above but brownish black and more humified. AD-6.7 VW-.09 Ash-4.8
2.5	Clay.	

Deposit 5: Capreol Township

	Site 1	
0 - 0.2	Green polytrichum.	
0.2 - 1.52	Dark brown to medium brown granular peat with many roots. H10.	
1.52	Rejection due to numerous roots.	
	Site 2	
0 - 0.6	Green polytrichum.	
0.6 - 1.09	Plastic dark brown peat. H10.	
1.09	Rejection due to numerous roots.	
	Site 3	
0 - 0.06	Green polytrichum.	
0.06 - 0.5	Brown humified peat with some fibre preserved. Many roots and wood particles preserved. Penetration difficult due to roots. H5.	Brownish black, fine grained and brittle. About 40% fibres and reed remnants. Remainder completely humified. AD-7.5 VW-.14 Ash-4.1
0.5 - 0.7	As above but much rotten wood and many roots. H5.	Dark brown, fine grained and brittle. 45% fibre and reed remnants. Remainder completely humified. AD-6.1 VW-.13 Ash-7.4
0.7	Rejection due to numerous roots.	
	Site 4	
0 - 0.4	Sphagnum with 20% roots. Very little humification. H2.	Light brown elastic, medium to coarse textured sphagnum, slightly humified with 20% reeds and rootlets. AD-10.3 VW-.08 Ash-4.7
0.4 - 0.7	Dark brown plastic to friable peat. Felty fibrous material still visible. Numerous roots. H8.	Dark brown, brittle and hard with about 10% fine fibre preserved. AD-7.1 VW-.13 Ash-7.9
0.7	Fine clay.	
	Site 5	
0 - 0.3	Sphagnum with many rootlets 10% humified material. H4.	Medium brown, medium textured elastic sphagnum with 25% reeds and fine rootlets, commercial quality but would be dusty. AD-8.5 VW-.09 Ash-5.3
0.3 - 2.0	Medium brown plastic to friable peat with 30% reeds and felty fibre remnants. Layers of partly decomposed wood. H6.	Dark brown, fine grained and brittle with reed and fine fibre remnants. AD-5.9 VW-.10 Ash-22.0
2.0	Fine clay.	

Deposit 6: Capreol Township

	Site 1	
0 - 0.15	Polytrichum.	
0.15 - 0.76	Medium brown relatively unhumified fine fibred felty sedge. H3.	
0.76 - 1.21	Medium brown, relatively unhumified fine fibred sphagnum. Roots at 0.91. H3.	
1.21 - 1.52	As 0.15-0.76.	
1.52 - 1.82	No recovery.	
1.82 - 2.74	Light brown sedge-sphagnum mixture. H4.	
2.74 - 2.89	Dark brown humified sphagnum-sedge mixture. Greasy texture. H5.	

Depth Metres		Dried Appearance and Laboratory Results
2.89 - 3.04	Dark brown plastic amorphous peat. H8.	
3.04	Grey clay.	
	Site 2	
0 - 0.3	Polytrichum.	
0.3 - 0.76	Dark brown amorphous peat. H9.	
0.76 - 0.91	Woody to semi-plastic sedgey peat. Felty fibres slightly preserved. H7.	
0.91 - 1.22	Moister than previous section, fine-fibred to granular sedge. H4.	
1.22 - 1.52	Many roots, moderately fresh sedge.	
1.52	Point of rejection due to numerous roots.	
	Site 3	
0 - 0.3	Medium-coarse textured sphagnum with admixed charcoal and slender roots. H4.	Medium to dark brown sphagnum containing 25% humified material and 15% reeds. Could have economic possibilities but would be dusty. AD-9.0 VW-.10 Ash-10.6
0.3 - 1.8	Dark brown humified sphagnum somewhat plastic containing 25% roots and woody material.	Dark brown medium-fibred sphagnum containing 25% humified material with 20% sedge fibre remains. Will be dusty due to humification and fine fibre content. AD-8.0 VW-.10 Ash-4.0
1.8	Point of rejection.	

Deposit 7: Hallam Township

	Site 1	
0 - 0.15	Green sphagnum and grass.	
0.15 - 0.91	Brown, fine-fibred herbaceous sedge somewhat humified. H4.	
0.91 - 3.04	Admixture of fine reeds, grass and sedge. Dark brown. H5.	
3.04	Grey clay.	
	Site 2	
0 - 0.3	Green sphagnum and grass.	
0.3	Sand.	
	Site 3	
0 - 0.15	Green sphagnum and grass.	
0.15 - 1.22	Brown, fine-fibred herbaceous sedge somewhat humified. H4.	
1.22 - 1.83	Silty quick sand.	
	Site 4	
0 - 0.20	Green sphagnum and grass.	
0.20 - 2.74	Brown, fine-fibred herbaceous sedge somewhat humified. H4.	
2.74 - 3.05	Light brown relatively unhumified polytrichum. H4.	
3.05 - 3.96	Plastic granular peat. H9.	
3.96	Plastic grey clay.	
	Site 5	
0 - 0.3	Green sphagnum	Light brown, coarse and elastic. AD-17.4 VW-.06 Ash-20.2
0.3 - 2.5	Very moist humified sphagnum. Dark brown and plastic. Some roots. H7.	Dark brown fine-textured sphagnum 50% humified. Semi-elastic to brittle. AD-7.9 VW-.11 Ash-5.6
2.5 - 4.25	Light brown slightly humified sphagnum. H3.	Medium brown fine-textured elastic sphagnum with 15% reeds and rootlets.

Depth Metres		Dried Appearance and Laboratory Results
4.25	Sandy clay.	AD-12.8 VW-.08 Ash-4.1
	Site 6	
0 - 0.15	Admixture of green sphagnum and grass.	
0.15 - 0.6	Peat.	
0.6	Sand.	

Deposit 8: Galbraith Township

	Site 1	
0 - 0.3	Green sphagnum.	AD-23.2 VW-.06 Ash-1.9
0.3 - 1	No recovery.	
1 - 1.5	Medium brown plastic peat admixed with reeds and rootlets. Some fine fibrous material preserved. H5.	Dark brown hard fine-textured peat with 10% fibre content preserved and 15% rootlets. AD-5.3 VW-.13 Ash-NSS
1.5 - 3.0	Medium brown slightly humified sphagnum free of roots and rootlets. H3.	Dark brown fine-textured sphagnum, somewhat dusty, 20% humified. Some fine rootlets present. Semi-elastic to brittle. AD-10.6 VW-.07 Ash-4.3
3.0 - 4	Dark brown plastic peat. H8.	Brownish black medium-grained hard peat with 15% fibre remnants. AD-7.8 VW-.10 Ash-4.6
4 - 5	Dark brown humified hypnum fibre content preserved. H5.	Dark brown, fine-grained elastic to brittle peat with 70% fibres preserved. Some roots and rootlets. Dusty. AD-14.4 VW-.09 Ash-9.3
5 - 5.25	Grey-brown plastic peat. Little fibre preserved. H9.	Greyish brown, hard and brittle. Granular texture. AD-8.6 VW-.09 Ash-45.0
5.25 - 6.0	Grey-brown, peat-clay mixture.	
6.0	Light grey-blue clay.	
	Site 2	
0 - 0.2	Green sphagnum.	
0.2 - 0.4	Medium brown slightly humified sphagnum. H2.	Medium brown, medium-textured elastic sphagnum containing 5% humified material. AD-14.3 VW-.06 Ash-5.2
0.4 - 1.0	No recovery.	
1 - 2.5	Medium brown, plastic peat with some preserved reeds and fibre. H7.	AD-11.6 VW-.13 Ash-3.6
2.5 - 3	Dark brown sphagnum relatively free of roots and reeds. H4.	Medium brown, medium-textured sphagnum, elastic. 5% rootlets and 5% humified material. AD-12.1 VW-.07 Ash-7.0
3 - 4	Dark brown amorphous peat. Some admixed clay. H9.	AD-9.3 VW-.08 Ash-44.2
4 - 4.5	Peat-clay mixture.	
4.5	Clay.	
	Site 3	
0 - 0.3	Green sphagnum.	
0.3 - 0.5	Medium brown sphagnum. Some roots, somewhat humified. H3.	Medium brown, medium textured. 20% humified and 15% rootlets. Elastic. Somewhat dusty. AD-17.5 VW-.09 Ash-3.6
0.5 - 1.5	Dark brown sphagnum somewhat greasy with some roots and reeds. H4.	Medium brown, fine textured elastic with 25% humified material. Somewhat dusty. AD-10.5 VW-.07 Ash-2.3
1.5 - 2.8	Medium brown sphagnum. Some reeds. Somewhat humified. H3.	Dark brown, medium textured with 10% humified material and 10% rootlets. Elastic. AD-13.3 VW-.05 Ash-4.6
2.8 - 3.0	No recovery.	
3 - 3.25	Humified peat, fibrous texture evident. H5.	Dark brown fine-grained hard brittle

Depth Metres		Dried Appearance and Laboratory Results
3.25 - 6.0	Amorphous brownish grey peat.	peat with 40% of the fibre content preserved. AD-16.4 VW-.15 Ash-33.0
6.0	Grey clay with some peat.	Greyish-brown, fine grained, friable and hard. Some admixed clay. AD-9.2 VW-.09 Ash-52.3

Deposit 11: Fenwick Township

Site 1

0 - 0.2	Green sphagnum.	
0.2 - 0.6	Dark brown plastic peat, some fibres preserved. H7.	Brownish black, fine-grained, hard and brittle peat with 10% fibre preserved. AD-5.0 VW-.16 Ash-18.7
0.6	Sand.	

Site 2

0 - 0.2	Green sphagnum and grass.	
0.2 - 0.75	Dark brown plastic peat with some fibre and grass remnants. H5.	Brownish black fine-grained, hard and brittle peat containing 50% hair-like fibre tendrils. AD-4.9 VW-.16 Ash-8.6
0.75	Sand.	

Site 3

0 - 0.1	Green sphagnum and grass.	
0.1 - 0.7	Medium brown plastic peat with some grass and reeds and felty fibre preserved. H6.	Brownish black fine-grained peat, hard and brittle. 10% reed remnants. AD-5.4 VW-.21 Ash-14.0
0.7	Sand.	

Site 4

0 - 0.3	Green sphagnum.	
0.3 - 0.5	Medium brown plastic to granular peat. Some residual fibre visible. H7.	Brownish black fine-grained peat. Hard and brittle. 20% fine fibre visible. AD-4.6 VW-.16 Ash-16.3
0.5	Sand.	

Deposit 13: Lyon Township

Site 1

0 - 0.4	Green moss.	
0.4 - 1.9	Medium brown, felty textured peat. Much woody material and many roots. H5.	Fine-fibred dark brown peat. Fibres in a matrix of amorphous peat. Brittle, contains 10% fine roots and 20% reeds. AD-7.6 VW-.09 Ash-6.1
1.9	Soft grey clay.	

Site 2

0 - 0.2	Green moss.	
0.2 - 2.3	Chocolate brown felty textured peat. Many roots. H5.	As above, 15% fine rootlets, 5% reeds, 45% fibres. AD-7.9 VW-.10 Ash-7.1
2.3	Soft grey clay.	

Site 3

0 - 0.3	Green moss.	
0.3 - 2.3	Dark brown felty textured peat. Much woody material. H5.	As above, 5% fine rootlets, 5% reeds, 45% fibres. AD-7.1 VW-.11 Ash-9.7
2.3	Grey clay.	

Depth Metres		Dried Appearance and Laboratory Results
	Site 4	
0.02 - 0.2	Green moss.	
0.2 - 2.2	Medium brown felty peat. Woody material present. H5.	As site 3, 0.3-2.3 5% fine rootlets, 10% reeds, 50% fibres. AD-6.7 VW-.12 Ash-9.3
2.2	Soft grey clay.	
	Site 5	
0 - 0.15	Green moss.	
0.15 - 2.2	Chocolate brown felty peat. Woody material present. H5.	As site 3, 0.3-2.3, 20% fine rootlets, 5% reeds, 30% fibres. AD-7.3 VW-.11 Ash-7.5
2.2	Clay.	
	Site 6	
0 - 0.3	Green moss.	
0.3 - 1.95	As 0.15-2.2 above. Many roots. H5.	As site 3, 0.3-2.3, 5% fine rootlets, 5% reeds, 35% fibres. AD-7.9 VW-.12 Ash-7.1
1.95	Soft grey clay.	

Deposit 15: Lyon Township

Depth Metres		Dried Appearance and Laboratory Results
	Site 1	
0 - 0.2	Green moss.	
0.2 - 0.5	No recovery.	
0.5 - 1.0	Chocolate brown peat, fibrous. H4.	Dark brown, fine-fibred, brittle peat. 50% fibres in a matrix of granular peat. 5% rootlets, 10% reeds. AD-10.3 VW-.09 Ash-4.7
1.0 - 1.5	As above. H4.	As above, 15% reeds, 10% roots. AD-10.7 VW-.07 Ash-6.6
1.5 - 2.0	As above. H4.	As above but brownish black. AD-8.5 VW-.10 Ash-9.1
2.0	Grey sandy clay.	
	Sites 2 - 4	
	Roots too dense to permit sample collection.	
	Site 5	
0 - 0.5	No recovery.	
0.5 - 1.0	Medium brown sedgy peat with admixed reeds and small roots. H3.	Dark brown, fine-fibred, semi-elastic to brittle peat. 60% fine fibres in a 35% mixture of granular peat. 5% fine rootlets. Would produce too dusty a product to be commercial. AD-10.7 VW-.08 Ash-6.1
1.0 - 1.5	Chocolate brown sedgy peat with admixed woody material. H4.	As above, 40% fine fibres, 20% rootlets, 15% reeds. AD-12.0 VW-.07 Ash-6.1
1.5 - 2.0	As 1.0-1.5 H4.	As above, 50% fine fibres, 20% fine reeds. AD-9.0 VW-.09 Ash-7.7
2.0	Clay.	
	Sites 6 - 11	
	Roots too dense to permit sample collection.	
	Site 12	
0 - 0.5	No recovery, green moss.	
0.5 - 1.0	Dark brown compact sedgy peat. Grass fibres preserved. H4.	Dark brown, fine-grained brittle peat. 10% rootlets, 5% fine reeds, and 20% fibres in a matrix of granular peat. AD-9.1 VW-.09 Ash-6.8
1.0 - 1.5	As above. H4.	As above, 20% fine reeds and 50% fibres. AD-5.0 VW-.15 Ash-15.3

Depth Metres		Dried Appearance and Laboratory Results
1.5	Clay.	

Deposit 16: Lyon Township

Site 1

0 - 0.3	No recovery, green moss.	
0.3 - 0.5	Medium brown admixture of grass and wood 30% humified material, much water. H3.	Sedgy peat. Dark brown, 10% fine reeds, 55% medium textured fibres in a granular peat matrix. Brittle. AD-5.8 VW-.11 Ash-11.0
0.5 - 1.0	Medium brown sedge peat with woody material and rootlets. Much water. Slightly more humified than above. H4.	Dark brown sedgy brittle peat. Fine textured. 10% fine rootlets, 20% reeds, 55% fibres in a granular peat matrix. AD-5.0 VW-.17 Ash-10.0
1.0 - 1.6	Chocolate brown peat with some rootlets and admixed woody material. H7.	Brownish black brittle fine-textured peat with sedge and reed remnants. 10% H3 reeds, 20% residual fibre in a granular peat matrix. AD-5.6 VW-.15 Ash-12.2
1.6	Sandy clay.	

Site 2

0 - 0.3	No recovery, green moss.	
0.3 - 0.5	Medium brown fibrous peat with some admixed reeds and rootlets. H3.	Sedge-reed peat. Medium brown, fine textured, 50% reeds and fine rootlets with 10% fibre remnants in a granular peat matrix. Elastic to brittle. AD-8.7 VW-.11 Ash-10.2
0.5 - 1.5	Chocolate brown felty plastic peat with admixed rootlets and wood. H7.	Dark brown fine-textured brittle sedge-reed peat. 10% fine roots, 10% reeds and 20% fibre remnants in a granular peat matrix. AD-6.5 VW-.15 Ash-10.2
1.5	Brown sand peat admixture.	

Site 3

0 - 0.4	No recovery, green moss and water.	
0.4 - 0.5	Medium brown felty peat with admixed wood, grass and fine roots. H5.	Dark brown fine-textured brittle sedge reed peat. 40% fibre remnants and 5% reeds in a matrix of granular peat. AD-5.8 VW-.14 Ash-8.9
0.5 - 1.0	Chocolate brown peat as above but more humified. H7.	As above with 20% H3 reeds and 20% fibre remnants. AD-5.5 VW-.14 Ash-10.5
1.0 - 1.7	Root layer - no sample.	
1.7	Grey plastic clay.	

Site 4

0 - 0.4	No recovery, green moss and water.	
0.4 - 0.5	Medium brown fibrous sedge-reed peat. H3.	Medium-textured medium brown sedge-reed peat. Elastic to brittle. 10% rootlets and 80% fibres in 10% humified material. Would make a crumbly dusty product. AD-9.5 VW-.09 Ash-7.3
0.5 - 1.6	Chocolate brown plastic peat containing admixed reeds, rootlets and woody material. H5.	Fine-textured, dark brown brittle sedge-reed peat. 20% H3 reeds and 50% fibre remnants in a matrix of granular peat. AD-7.8 VW-.10 Ash-11.1
1.6	Grey sandy clay.	

Site 5

0 - 0.4	No recovery, green moss and water.	
0.4 - 2.0	Chocolate brown plastic peat containing admixed roots and woody material. H5.	Fine-textured dark brown brittle sedge-reed peat. 60% fibre remnants, 10% root-

Depth Metres		Dried Appearance and Laboratory Results
		lets and 5% reeds in a matrix of peat. AD-6.9 VW-.12 Ash-8.1
2.0 - 2.3	Root matt, no samples collected.	
2.3	Light grey clay. Section rooty throughout.	
	Site 6	
0 - 0.25	No sample, green moss.	
0.25 - 1.5	Medium brown, fibrous peat. H5.	Dark brown, fine-textured brittle sedge-reed peat. Some fine rootlets, 10% fine reeds and 25% fibre residue in humified matrix. AD-8.9 VW-.09 Ash-7.4
1.5 - 1.8	Medium brown felty peat. H4.	As above with 65% sphagnum - sedge fibre remnants. Humification somewhat patchy. AD-8.8 VW-.10 Ash-12.6
1.8	Grey sandy clay.	
	Site 7	
0 - 0.3	No recovery, green moss.	
0.3 - 1.0	Medium brown fibrous peat. Some rootlets and grass present. Much water. H4.	Medium dark brown fine-textured elastic to brittle sedge-reed peat. 20% fine H3 reeds and 50% fibre remnants in amorphous peat matrix. AD-7.4 VW-.11 Ash-9.4
1.0 - 1.6	Chocolate brown plastic amorphous peat with some fibrous remnants visible. H7.	Dark brown fine-textured brittle sedge-reed peat. 10% fine H3 reeds and 30% fine fibre remnants in a matrix of amorphous peat. AD-7.8 VW-.13 Ash-1.22
1.6	Grey clay.	

Deposit 18: Conacher Township

	Site 1	
0 - 0.5	No recovery, surface sphagnum.	
0.5 - 2.5	Uniform dark brown peat. Drier than average. Residual fibre consists of sphagnum, reeds and fine rootlets. H8.	Dark brown to medium brown fine-textured hard peat containing 35% residual fibres, rootlets and reeds. AD-5.04 VW-.154 Ash-6.16
2.5 - 2.75	Dark grey plastic clay.	
	Site 2	
0 - 0.4	No recovery, surface sphagnum.	
0.4 - 1.5	Dark brown peat with some fine-textured residual sphagnum fibre, reeds and rootlets. H5.	Dark medium brown fine-textured peat containing 40% residual sphagnum fibres and 10% reeds and fine rootlets - hard. AD-8.20 VW-.108 Ash-5.79
1.5 - 2.45	Dark brown, greasy peat with residual fine felt-like fibres. H9+.	Fine-textured dark brown, hard peat. Some residual sphagnum fibres and reeds. Good uniform peat. AD-4.90 VW-.128 Ash-9.72
2.45	Grey plastic clay.	
	Site 3	
0 - 0.25	No recovery, surface sphagnum.	
0.25 - 2.4	Dark brown peat with a felty residue. Relatively dry. H9+.	Fine-textured dark brown hard peat. Some residual sphagnum fibres and reeds. Uniform peat. AD-3.13 VW-.216 Ash-14.7

Deposit 21: Fallis Township

Depth Metres		Dried Appearance and Laboratory Results
	Site 1	
0 - 0.28	No recovery, sphagnum and grass.	
0.28 - 1.75	Brownish black humified sphagnum. H4.	Fine grained, slightly elastic to brittle, dark brown, consisting of 40% reeds and rootlets and 20% residual sphagnum in a humified matrix. AD-4.77 VW-.148 Ash-7.34
1.75	Clay.	
	Site 2	
0 - 0.4	No recovery, sphagnum and grass.	
0.4 - 0.65	Dark brown peat, 50% fine fibres preserved. H7.	
0.65 - 1.0	Medium brown felty textured peat. H6.	Medium brown, fine textured and brittle. 40% reeds and rootlets in a humified matrix. AD-5.45 VW-.113 Ash-8.42
1.0 - 1.5	As above but moister. H6.	As above with about 10% fine fibres preserved. AD-5.62 VW-.134 Ash-10.2
1.5 - 2.5	As from 1.0-1.5. H6.	As above but slightly more fibrous. AD-5.82 VW-.128 Ash-8.0
	Site 3	
0 - 0.2	Admixture of moderately humified sedge, roots and reeds. H5.	Medium brown fine-textured brittle peat with 5% fibre remnants and 40% reeds. AD-7.27 VW-.100 Ash-78.0
0.2	Sandy clay.	
	Site 4	
0 - 0.1	Sphagnum.	
0.1 - 1.2	Dark brown amorphous peat.	Dark brown fine-textured dense hard peat with 10% fine fibres and 10% reeds preserved. AD-2.6 VW-.264 Ash-32.4
1.2	Clay.	

Deposit 22: Gibbard Township

	Site 1	
0 - 0.5	No recovery, green moss and water.	
0.5 - 3.9	Dark brown plastic peat with admixed wood and grass. H6.	Fine-textured brittle dark brown peat with some sphagnum-sedge fibres preserved. Minor reeds. 45% fine fibre and sphagnum remnants in amorphous peat. AD-8.2 VW-.10 Ash-11.8
3.9	Soft grey clay.	
	Site 2	
0 - 0.4	No recovery, green moss and water.	
0.4 - 3.6	Chocolate brown felty peat, much water. H4.	Dark brown elastic to brittle sedge peat with sphagnum remnants. Fine textured, 15% reeds, 35% fine fibre and sphagnum remnants in an amorphous peat matrix. AD-7.2 VW-.12 Ash-9.5
3.6	Soft fine grey clay.	
	Site 3	
0 - 0.4	No recovery, green moss and water.	
0.4 - 3.5	Chocolate brown fibrous peat with admixed grass, rootlets and woody material. Much water. H4.	Dark brown fine-textured brittle to elastic sedge-sphagnum peat. 70% sphagnum and fine fibres with humified areas. Non-commerical, too brittle and dusty. AD-7.7 VW-.11 Ash-9.1
3.5 - 3.9	Root matt, no sample.	

Depth Metres		Dried Appearance and Laboratory Results
3.9	Soft grey clay.	
	Site 4	
0 - 0.6	No recovery, green moss, much water.	
0.6 - 3.5	Chocolate brown fibrous peat. Admixed rootlets and woody material. H4.	Dark brown fine-textured brittle to elastic sphagnum peat. 10% rootless, 10% fine H3 reeds and 60% fine fibre remnants and sphagnum remnants. AD-7.3 VW-.11 Ash-8.6
3.5 - 4.0	Dark brown felty peat. H6.	Dark brown fine-textured brittle, sedge peat with 5% fine H3 reeds and 25% fine fibre remnants in peat. AD-7.7 VW-.12 Ash-14.9
4.0	Bottom.	

Deposit 23: Gibbard Township

	Site 1	
0 - 0.20	No sample, green moss.	
0.20 - 1.0	Medium brown fibrous peat, rooty. H4.	Dark brown fine-textured brittle to elastic sedge peat with some sphagnum remnants. 10% fine reeds, 10% fine rootlets, 60% fibre as sphagnum remnants. AD-8.3 VW-.10 Ash-10.3
1.0 - 2.2	Reddish brown turning to dark brown on exposure. Fibrous rooty peat. Section difficult to penetrate due to many roots. H4.	Dark brown fine-textured brittle to elastic sedge peat. Contains minor reeds and fine rootlets, 65% fine fibre remnants and some sphagnum remnants in a humified matrix. AD-8.6 VW-.10 Ash-6.6
2.2 - 2.8	Root matt, no samples.	
2.8	Admixed peat and sand. Sample column rooty throughout.	
	Site 2	
0 - 0.4	No recovery. Green moss and water.	
0.4 - 2.3	Reddish brown fibrous peat which changes to dark brown on exposure. Many roots. H4.	Dark brown fine-textured elastic to brittle sedge peat with sphagnum remnants. 10% fine H3 reeds and 40% fine fibres with sphagnum remnants. Irregularly humified patches. Would produce a dusty product. AD-8.1 VW-.11 Ash-27.8
2.3 - 2.8	Dark brown amorphous peat with many roots. H9.	Medium brown hard amorphous peat containing 10% rootlets. AD-3.3 VW-.26 Ash-27.8
2.8	Point of rejection.	
	Site 3	
0 - 0.25	No recovery, green moss.	
0.25 - 2.0	Light brown fibrous peat. H4.	Medium brown fine-textured elastic to brittle sphagnum-sedge peat. 70% fibre remnants and 5% fine reeds and rootlets in a matrix of fine-grained peat. AD-9.4 VW-.09 Ash-1.9
2.0 - 2.3	As above.	As above. AD-11.8 VW-.08 Ash-3.4
2.3 - 4.0	Dark brown plastic to greasy peat. H7.	Dark brown fine-textured hard peat. 45% sphagnum-sedge fibre remnants and minor reeds in a fine-grained humified matrix. AD-10.5 VW-.09 Ash-4.5
4.0	Fine grey clay.	
	Site 4	
0 - 0.3	No recovery, green moss.	

Depth Metres		Dried Appearance and Laboratory Results
0.3 - 0.5	Medium brown felty peat with some admixed grass and roots. H4.	Medium brown fine-textured elastic to brittle fibrous peat, 85% fine sphagnum remnants in humified matrix. Would produce a heavy dusty product. AD-9.7 VW-.09 Ash-NSS
0.5 - 1.9	Dark brown amorphous peat with admixed roots. Rooty section from 1.5-1.9. H7.	Dark brown fine-textured hard peat with 10% reeds and rootlets and 30% fibre remnants. AD-6.1 VW-.14 Ash-4.0
1.9 - 2.1	Root matt.	
2.1	Bottom in clay.	
	Site 5	
0 - 0.5	No recovery, green moss.	
0.5 - 2.4	Dark brown felty peat, much admixed wood and roots. H6.	Dark brown, fine-textured hard peat. 20% fine rootlets and reeds, 20% fine fibre remnants. AD-6.1 VW-.13 Ash-6.8
2.4	Fine sand.	
	Site 6	
0 - 0.2	No recovery, green moss.	
0.2 - 0.9	Chocolate brown plastic amorphous peat with much water. Many roots. H6.	Dark brown fine-textured brittle peat with 20% fine fibre remnants and 20% fine reeds. AD-6.5 VW-.12 Ash-17.7
0.9	Grey sandy clay.	
	Site 7	
0 - 0.6	No recovery, green moss and water.	
0.6 - 1.4	Medium brown felty peat. Many roots. H6.	Dark brown, fine-textured brittle peat. 20% fine reeds and 20% fibre remnants in amorphous matrix. AD-6.1 VW-.13 Ash-12.4
1.4	Sandy grey clay.	

Deposit 24: Stedman Township

	Site 1	
0 - 0.5	Brownish black humified sphagnum-grass admixture. H6.	
0.5 - 1.5	As above. H6.	Dark brown fine-textured brittle, light peat with 50% fine fibres preserved. AD-7.46 VW-.103 Ash-13.4
1.5 - 2.0	Dark brown felty textured peat. H5.	Dark brown fine-textured hard peat containing 45% fine fibre remnants and 5% reeds. AD-9.11 VW-.095 Ash-9.81
2.0	Point of rejection. Either a root or very hard clay.	
	Site 2	
0 - 0.25	No recovery.	
0.25 - 1.5	Amorphous peat. H7.	Fine-textured brownish black peat with 35% fine fibres preserved and 5% reeds. AD-4.86 VW-.148 Ash-34.8
1.5	Hard clay.	
	Site 3	
0 - 0.3	No recovery, sphagnum and grass.	
0.3 - 0.5	Medium brown felty peat. H7.	Medium brown fine-grained brittle peat containing 55% fine sphagnum remnants and 5% reeds. AD-3.62 VW-.205 Ash-7.15
0.5 - 1.5	Medium brown, slightly more humified, fewer reeds. Moister than fore-going. H8.	Medium dark brown fine textured brittle peat, 40% fine sphagnum remnants and

Depth Metres		Dried Appearance and Laboratory Results
		a few reeds and rootlets. AD-6.35 VW-.120 Ash-6.52
1.5 - 1.7	Clay-sand-peat mixture.	
1.7 - 2.4	Brown felty peat, turns greyish black after 5 to 10 minutes exposure to air. H7.	Dark brown, fine-textured brittle peat, 50% fine sphagnum fibres. AD-8.31 VW-.096 Ash-12.9
2.4	Clay with some peat.	
	Site 4	
0 - 0.25	No recovery, sphagnum and grass.	
0.25 - 1.52	Dark brown felty fibrous humified peat.	Medium brown fine- to coarse-textured material. About 70% sphagnum with a few reeds and fibres in a humified matrix. Elastic to brittle. Would be too dusty for commercial use. AD-7.35 VW-.084 Ash-8.73
1.52 - 2.5	Lighter brown than above, slightly more humified. Fibres of sphagnum visible. H7.	Dark brown, fine-textured brittle to elastic material about 35 to 40% residual sphagnum fibres in a humified matrix. AD-5.09 VW-.148 Ash-10.0
2.5 - 3.25	Dark brown, felty humified peat. H6.	Dark brown, fine-textured brittle peat with about 60% residual sphagnum fibres in a humified matrix. A light peat. AD-7.00 VW-.111 Ash-33.6
3.25	Grey sandy clay.	
	Site 5	
0 - 1.0	No recovery, fresh sphagnum.	
1.0 - 2.0	Brown peat with fine felty fibres. H6.	Dark brown fine-textured brittle peat with about 60% residual sphagnum fibres and 5% reeds. A light peat. AD-8.37 VW-.087 Ash-9.11
2.0 - 4.7	Lighter brown and coarser fibred than above. Fibre remnants are a sedge-sphagnum admixture. Turns black after 5 minutes exposure to air. H6.	Dark brown fine-textured light peat with about 22% each of fine sedge and sphagnum remnants and 5% reeds in a humified matrix. AD-8.95 VW-.108 Ash-11.8
Note: Not sampled past 4.7		
	Site 6	
0 - 0.25	No recovery, fresh sphagnum.	
0.25 - 0.45	Brown peat with fine felty fibres preserved. H7.	Light brown mixture of elastic sphagnum and humified material. Possible commercial value. AD-6.83 VW-.136 Ash-4.35
0.45 - 3.0	Medium brown sphagnum. H4.	Medium brown, medium-textured sphagnum containing some humified patches and about 5% reeds. Elastic to brittle. Possible commercial value but could be dusty due to humified portions. AD-14.28 VW-.063 Ash-2.33
3.0 - 4.0	Felty textured peat.	Medium dark brown fine-textured brittle peat containing about 30% residual sedge remnants and reeds. AD-9.90 VW-.081 Ash-8.61
4.0 - 4.7	Dark brown peat with a few residual hair-like fibres.	Medium dark brown fine-textured and hard peat with 15% fine sedge fibres and 5% reeds in a humified matrix. AD-6.60 VW-.125 Ash-11.40
Note: Not sampled past 4.7		
	Site 7	
0 - 1.2	No recovery.	
1.2 - 1.7	Slightly humified. Medium brown sphagnum. H2.	Light brown, medium-textured elastic sphagnum with a few fine rootlets. Commercial quality. AD-13.84 VW-.051

Depth Metres		Dried Appearance and Laboratory Results
		Ash-2.26
1.7 - 2.0	Fine, moderately humified sphagnum. H5.	Light medium brown, fine-textured, elastic to brittle light peat. About 70% sphagnum fibres preserved in a humified matrix. Would be too dusty to be commercial. AD-10.9 VW-.076 Ash-2.68
2.0 - 2.5	Relatively unhumified light brown sphagnum. H3.	Light brown fine-textured elastic sphagnum containing 10% fine roots and reeds and about 15% humified matrix. Commercial quality. AD-13.65 VW-.053 Ash-NSS
2.5 - 3	As from 1.2-1.7.	Note: Sample tags gave sample interval for 2.5 to 4.7. However, dried inspection and laboratory results indicate the correct interval to be 3.0-4.7.
3.0 - 4.7	Greasy, fine-fibred felty peat. H5.	Medium dark brown fine-textured hard peat with 20% roots and fine sedge fibres preserved. AD-10.74 VW-.063 Ash-4.85
Note: Not sampled past 4.7		
	Site 8	
0 - 0.45	No recovery. Fresh sphagnum.	
0.45 - 3.0	Light brown slightly humified sphagnum. Numerous long tendril-like roots and larger roots. Large roots at 2.5-3.0. H3.	Light brown elastic medium-textured sphagnum with some humified patches and a few fine sedge fibres and reeds. Commercial quality. AD-13.13 VW-.063 Ash-4.28
3.0 - 3.5	As above with two 1 cm seams of greasy more humified sphagnum. H3 and H4.	Medium light brown elastic to brittle, fine-textured sphagnum. Marginal quality due to dustiness imparted by the more humified seams. AD-10.11 VW-.078 Ash-4.29
3.5 - 5.5	Medium brown greasy sphagnum. H4.	Dark medium brown, fine-textured and brittle. Admixture of sphagnum, sedge, and reeds containing numerous humified areas. AD-9.14 VW-.090 Ash-5.61
5.5 - 5.95	Medium brown, moderately humified, greasy peat, fibrous.	Medium brown, fine-textured hard to brittle peat. 30% fine fibres and reeds in a humified matrix. AD-3.14 VW-.226 Ash-49.2
5.95 - 6.0	Grey clay.	
	Site 9	
0 - 0.5	No recovery, fresh sphagnum.	
0.5 - 2.5	Medium brown slightly humified sphagnum. H3.	Light brown, medium textured and elastic. A few reeds present. AD-11.62 VW-.067 Ash-3.73
2.5 - 2.75	Medium brown. Moderately humified sphagnum with a greasy feel, finer fibres than preceding section. H5.	Medium brown fine-textured hard light peat. 25% reeds and rootlets + 25% sphagnum in irregularly humified areas. AD-9.47 VW-.080 Ash-3.39
2.75 - 3.5	Medium brown humified fine sphagnum with a greasy feel. H6.	Medium dark brown fine-textured brittle peat. 20% reeds and rootlets, 20% sphagnum residue in a humified matrix. AD-8.00 VW-.094 Ash-6.08
3.5	Point of rejection due to a matted layer of heavy roots.	

Deposit 25: Trewartha Township

	Site 1	
0 - 0.3	No recovery, green moss.	
0.3 - 0.5	Dark brown plastic peat. H5.	Dark brown, fine-textured hard peat with

Depth Metres		Dried Appearance and Laboratory Results
0.5	Point of rejection due to many roots.	20% reeds and 20% fine fibre remnants in humified matrix.
	Site 2	
0 - 0.5	No recovery, green moss.	
0.5 - 1.5	Fibrous, felty peat. Brown turns black on exposure. H5.	Dark brown fine-textured, brittle peat. 60% fine sphagnum fibre remnants in humified matrix. AD-8.3 VW-.09 Ash-9.4
1.5 - 2.25	As 0.5-1.5.	
2.25	Grey sandy clay.	
	Site 3	
0 - 1.0	No recovery, wet.	
1.0 - 4.25	Dark brown fibrous felty peat. H5.	Dark brown, fine-textured brittle peat. 60% fine sphagnum remnants in humified matrix. AD-8.8 VW-.10 Ash-13.0
4.25	Grey sandy clay.	
	Site 4	
0 - 0.5	No recovery, green moss.	
0.5 - 1.0	Earthy peat, some fine fibres visible. H9.	Medium brown, fine-textured brittle peat. 50% fine sedgy fibre residues, reeds and rootlets in amorphous matrix. AD-5.7 VW-.11 Ash-NSS
1.0	Point of rejection due to roots.	
	Site 5	
0 - 0.5	No recovery, green moss.	
0.5 - 0.75	Earthy peat, some fine fibres visible. H9.	Dark brown, fine-textured, hard peat. 20% fine sphagnum fibre residue in amorphous matrix. AD-3.7 VW-.23 Ash-14.9
0.75	Hornblende-biotite-quartz-feldspar-peat mixture.	
	Site 6	
0 - 0.3	No recovery, green moss.	
0.3 - 0.5	Dry compact peat. Too compact to penetrate further. H8.	
	Site 7	
0 - 0.3	No recovery, green moss.	
0.3 - 0.5	Compact, dry amorphous peat. H9.	Fine-textured, dark brown hard peat. 10% fine reeds and sphagnum fibre remnants. AD-5.3 VW-.14 Ash-NSS
0.5	Peat too compact to permit further penetration.	
	Site 8	
	Dried lake, saturated peat at surface. Too unstable to permit sampling.	
	Site 9	
0 - 0.95	No recovery, sphagnum.	
0.95 - 1.0	Fine fibrous sphagnum. H3.	
1.0 - 1.75	Medium brown fibrous sphagnum, a little more humified. H4.	Medium brown, elastic to brittle, fine-textured sphagnum 25% to 30% sphagnum fibres and 10% reeds in humified matrix. Would produce a dusty product.
1.75	Point of rejection due to many roots.	
	Site 10	
0 - 0.4	No sample. Green sphagnum.	
0.4 - 1.0	Sphagnum, slightly humified. H3.	

Depth Metres		Dried Appearance and Laboratory Results
1.0 - 1.15	Medium dark brown fibrous peat. Some admixed grass and fine rootlets. H6.	Dark brown fine-textured brittle peat. 35% fibre and sphagnum remnants, 15% reeds in a matrix of peat. AD-8.4 VW-.10 Ash-5.4
1.15 - 1.25	Dark brown plastic peat. H8.	Fine-textured brittle reed-sedge-sphagnum peat. 20% fine fibre remnants and 20% reeds in a peat matrix. AD-3.9 VW-.22 Ash-82.0
1.25	Sand-pebble-peat admixture.	
	Site 11	
0 - 0.5	No sample. Green moss.	
0.5 - 1.4	Medium brown, greasy peat with admixed grass and reeds. H8.	Dark brown, fine-textured, hard peat. 10% H3 reeds and 20% fine fibre remnants in a humified matrix. AD-9.3 VW-.09 Ash-3.2
1.4 - 1.6	Peat as above but chocolate brown. H8.	As above. AD-7.1 VW-.13 Ash-2.4
1.6	Pebbly sand.	
	Site 12	
0 - 0.5	No sample. Green moss.	
0.5 - 1.5	Dark brown semi-fibrous peat with 25% rootlets and reeds. H5.	Dark brown fine-textured brittle peat with 20% reeds and 10% fine fibre remnants in a humified matrix. AD-9.1 VW-.09 Ash-5.6
1.5 - 1.9	Dark brown plastic peat. H8.	As above, fewer reed remnants. AD-7.5 VW-.12 Ash-15.3
1.9	Dark grey sandy clay.	
	Site 13	
0 - 1.0	No recovery.	
1.0 - 1.2	Light brown sphagnum. Water. H3.	Light brown medium-textured elastic sphagnum with 10% rootlets and reeds. AD-12.4 VW-.07 Ash-5.9
1.2 - 1.4	Dark brown, granular peat. 20% grass and some reeds and rootlets. Much water. H7.	Medium brown, medium-textured elastic to brittle sphagnum containing humified patches. Marginal material, could be dusty. AD-7.5 VW-.12 Ash-2.5
1.4 - 1.5	Compact peat, could not penetrate further.	
	Site 14	
0 - 0.5	No sample, green moss and water.	
0.5 - 1.6	Medium brown plastic peat with admixed roots and rootlets. H6.	Medium dark brown fine-textured brittle peat. 20% reeds and 10% fibre remnants in humified matrix. AD-9.6 VW-.10 Ash-3.8
1.6 - 1.8	Brown, plastic amorphous peat. H9.	Dark brown, fine-textured hard peat with 5% reeds and 10% fibre remnants in humified matrix. AD-6.1 VW-.16 Ash-10.0
1.8	Grey pebbly clay.	
	Site 15	
0 - 0.2	No sample, green moss.	
0.2 - 2.1	Medium brown peat with a faint fibrous texture. Some admixed rootlets, grass and reeds. H8.	Dark brown fine-textured hard peat with 10% reeds and 10% fibre remnants in humified matrix. AD-8.8 VW-.10 Ash-5.1
2.1	Sandy greyish black clay.	
	Site 16	
0 - 1.7	No sample. Green moss.	
1.7 - 2.6	Brown peat, very little fibre visible. Much water from 2.0-2.6. H6.	Brownish black fine-textured brittle peat. 15% reeds and rootlets, 20% fibre rem-

Depth Metres		Dried Appearance and Laboratory Results
		nants in humified matrix. AD-8.7 VW-.10 Ash-8.1
2.6 - 4.0	Medium brown felty sedgy peat. Turns dark brown after 10 min. exposure. H5.	As above with 10% reeds and rootlets and 40% fibre remnants in a humified matrix. AD-9.2 VW-.09 Ash-7.2
4.0 - 4.25	Medium dark brown coarsely fibrous hypnum moss. H3.	Coarse-textured black hypnum. Structure well preserved. AD-16.1 VW-.05 Ash-NSS
4.25	Dark grey, fine sandy clay.	
	Site 17	
0 - 0.6	No sample. Green moss and water.	
0.6 - 4.25	Medium brown felty peat with admixed reeds and rootlets. H5.	Brownish black fine-textured brittle peat with 10% reeds and rootlets and 30% fine fibre in humified matrix. AD-8.4 VW-.11 Ash-6.0
4.25 - 4.75	Chocolate brown amorphous peat. H8.	As above but hard. AD-5.5 VW-.16 Ash-44.7
4.75	Brown peat-sand mixture.	
	Site 18	
0 - 0.5	Fresh sphagnum fibres suspended in water. H2.	
0.5 - 1.0	Sphagnum fibres suspended in water. H3.	
1.0 - 3.5	Excess water. Dark brown plastic peat residue intermixed with fresh sphagnum fibres. H3 & H7.	Medium brown medium-textured elastic sphagnum. 15% reeds, some rootlets, 60% sphagnum fibres in irregularly humified matrix. AD-9.8 VW-1.0 Ash-5.2
3.5 - 4.1	Fine-textured peat, some fibre remnants. H9.	Dark brown fine-textured hard peat. 10% fine rootlets and reeds with 30% fibre remnants in humified matrix. AD-9.4 VW-.11 Ash-15.9
4.1	Point of rejection, traces of sandy clay on sample point. Section fairly root-free with excess water.	
	Site 19	
0 - 1.5	No sample, green moss. Much water.	
1.5 - 4.0	Medium brown fibrous peat with excess water. H6.	Dark brown fine-textured hard peat. 10% reeds and 60% fine sphagnum fibre remnants in humified matrix. AD-11.2 VW-.08 Ash-5.7
4.0 - 4.25	Lighter brown, coarser. More fibrous, felty with admixed reeds and root chips. Turns darker brown after 10 min. exposure. H6.	As above with 10% reeds and 20% fine sphagnum fibre remnants in humified matrix. AD-7.9 VW-.11 Ash-8.5
4.25 - 4.7	Dark brown plastic peat. H6.	
4.7	Becomes progressively more compact to 4.7. Could not penetrate further.	
	Site 20	
0 - 0.4	No sample, green moss and water.	
0.4 - 3.9	Chocolate brown, amorphous plastic peat. Some admixed grass and rootlets. H7.	Brownish black, fine-textured hard peat. 10% rootlets and reeds with 50% fine sphagnum remnants in humified matrix. AD-9.0 VW-.11 Ash-3.8
3.9 - 4.0	Dark brown amorphous plastic peat. H9.	As above with 10% reeds and 30% fibre remnants. AD-4.7 VW-.17 Ash-NSS
4.0	Sandy peat.	
	Site 21	
0 - 0.5	Unhumified sphagnum. Much water.	Light brown, coarse-fibred elastic sphagnum. Good horticultural grade. Some admixed grass. AD-13.1 VW-0.07 Ash-11.4
0.5 - 2.0	Dark brown water with dispersed sphagnum fibres. No sample recovered.	
2.0 - 3.4	Fine-grained, dark brown semi-plastic peat. H7.	Dark brown, fine-textured hard peat. 15%

Depth Metres		Dried Appearance and Laboratory Results
		rootlets and reeds with 50% fine fibre remnants in humified matrix. AD-10.3 VW-0.09 Ash-2.4
3.4 - 3.5	A root.	
3.5 - 3.75	Fibrous-felty moss, dark brown. H3.	Brown, coarse-fibred, elastic, sphagnum with minor sedge fibres. 5% reeds with 80% fibre in blotchy humified material. AD-8.5 VW-0.09 Ash-NSS
3.75 - 4.0	Roots, no sample.	
4.0 - 4.5	As 2.0-3.4.	
4.5 - 4.7	Dark brown amorphous peat becoming progressively more compact with depth. H8.	Fine-textured, brownish black hard peat. 10% fine rootlets and reeds with 10% fine fibre remnants in humified matrix. AD-6.8 VW-0.12 Ash-11.5
4.7	Peat too compact to permit further penetration.	
	Site 22	
0 - 0.5	No sample, green moss.	
0.5 - 4.0	Medium brown fibrous peat. Somewhat plastic. Admixed wood chips indicating roots. H5.	A medium-textured, brittle dark brown light fibrous peat. 10% reeds and rootlets and 55% sphagnum fibre remnants in a blotchy humified matrix. AD-12.3 VW-0.07 Ash-5.2
4.0 - 4.5	No sample due to broken rod.	
4.5	Bottom, undetermined nature.	
	Site 23	
0 - 1.4	No sample, green moss.	
1.4 - 1.7	Light brown spahgnum dispersed in water. H3.	Light brown medium-textured elastic sphagnum. Horticultural quality but could be somewhat dusty due to short fibre. AD-14. VW-.07 Ash-4.6
1.7 - 4.0	Medium brown, fibrous felty peat. H5.	Medium brown, medium-textured hard peat. 5% fine-fibred sphagnum remnants in humified matrix. A light fibrous peat. 1.7 - 3.0: AD-11.8 VW-.08 Ash-3.9 3.0 - 4.0: AD-13.4 VW-.07 Ash-3.0
4.0	Root matt.	
4.0 - 4.5	Plastic, felty, fine-grained peat.	Dark brown, fine-textured hard peat. 10% rootlets and reeds with 20% fibre remnants some sphagnum in humified matrix. AD-8.8 VW-.09 Ash-2.6
4.5 - 5.0	Dry, compact peat. H9.	Brownish black hard peat. 30% fine reeds, rootlets and fibre remnants in humified matrix. AD-7.8 VW-.11 Ash-13.5
5.0	Peat too compact to permit further penetration.	
	Site 24	
0 - 0.5	No sample, green moss.	
0.5 - 1.0	Light brown, felty peat with admixed grass and roots.	Dark brown fine-textured brittle peat. Light fibrous type. 40% fine reeds and fibre remnants in humified matrix. AD-11.4 VW-.08 Ash-NSS
1.0 - 3.0	Chocolate brown amorphous peat with admixed grass. Free of water. H7.	Dark brown fine-textured brittle peat. 20% reeds and rootlets. 40% sphagnum remnants in humified matrix. AD-9.2 VW-.10 Ash-5.6
3.0 - 3.8	Chocolate brown amorphous peat. H9.	As above. AD-8.2 VW-.11 Ash-13.0
3.8	Peat gravel mixture with quartz.	
	Site 25	
0 - 1.5	No sample, much water.	
1.5 - 3.25	Too rooty to sample.	

Depth Metres		Dried Appearance and Laboratory Results
3.25	Sandy clay?	
	Site 26	
0 - 0.5	No sample, green moss and water.	
0.5 - 1.0	Chocolate brown peat, excess water. H9.	Brownish black, fine-textured, brittle peat. 20% fibre remnants and rootlets in humified matrix. AD-4.7 VW-.12 Ash-42.6
1.0 - 2.0	Brownish black, felty peat. H5.	Fibrous, brownish black, fine-textured brittle peat. 10% reeds with 45% fine fibre remnants in humified matrix. AD-7.1 VW-.18 Ash-NSS
2.0 - 3.2	Medium brown, dense felty peat with much admixed wood indicating a high root content. Some excess water. H6.	As above with 10% reeds and 35% fine fibre remnants in humified matrix. AD-7.7 VW-.11 Ash-15.9
3.2	Rock or boulder.	
	Site 27	
0 - 0.5	No sample, green moss and water.	
0.5 - 1.0	Medium brown felty to plastic peat. H5.	Medium brown, medium textured brittle fibrous peat. 20% reeds with 50% sphagnum fibres in humified matrix. AD-10.3 VW-0.09 Ash-4.6
1.0 - 2.5	Medium brown fibrous peat. H5.	As above. AD-11.0 VW-0.08 Ash-6.0
2.5 - 3.2	Medium brown plastic amorphous peat. H7.	Brownish black fine-textured brittle fibrous peat. 35% fine fibre remnants and 5% reeds in humified matrix. AD-8.1 VW-0.08 Ash-8.2
3.2	Coarse grey sand.	

Deposit 27: McNevin Township

	Site 1	
0 - 1.3	No sample, green moss.	
1.3 - 1.6	Medium brown moderately humified sphagnum. H4.	Medium brown fine-textured brittle peat. 10% reeds with 15% fine fibre remnants in humified matrix. AD-10.4 VW-0.8 Ash-5.3
1.6 - 1.75	Clay.	
	Site 2	
0 - 0.7	No sample, green moss.	
0.7 - 1.5	Medium brown moderately humified sphagnum. H4.	Medium brown, fine-textured brittle to hard fibrous peat. 10% reeds and rootlets, 55% fine fibres in humified matrix. AD-3.5 VW-.22 Ash-6.6
1.5 - 2.3	Dark brown fine humified sphagnum.	Dark brown fine-textured hard uniform peat. 10% reeds and rootlets with 40% fine fibre remnants in humified matrix. AD-8.6 VW-.09 Ash-7.5
2.3 - 2.6	Darker brown and drier than above. Some felty fibre remnants. H8.	As above with 10% reeds, rootlets and 10% fine fibre remnants. AD-7.2 VW-.13 Ash-18.6
2.6 - 2.7	Dark grey plastic clay.	
	Site 3	
0 - 0.4	No sample, green moss.	
0.4 - 1.0	Dark brown fibrous sphagnum peat. H5.	Uniform fibrous peat. Medium dark brown, fine textured and brittle. 20% reeds and rootlets with 30% fine fibres in humified matrix. AD-7.5 VW-.11 Ash-6.1
1.0 - 1.75	Dark brown sphagnum peat. H7.	Uniform dark brown brittle peat. 20%

Depth Metres		Dried Appearance and Laboratory Results
		reeds and rootlets with 20% fine fibre remnants in humified matrix. AD-8.9 VW-.10 Ash-7.2
1.75	Fine plastic peaty clay.	
	Site 4	
0 - 0.5	No sample, green moss.	
0.5 - 0.75	Dark brown fine humified sphagnum. H4.	Dark brown, brittle peat. Humification patchy. 10% reeds and rootlets with 50% fine sphagnum remnants in humified matrix. AD-7.4 VW-.11 Ash-7.0
0.75 - 1.3	Uniform amorphous peat. H8.	Dark brown hard peat. Humification patchy. 10% reeds and rootlets with 30% fine sphagnum remnants. AD-6.2 VW-.15 Ash-14.7
1.3 - 1.4	Fibrous sphagnum peat. H5.	
1.4 - 1.5	As 0.75-1.3.	
1.5 - 1.6	Hard compact black dry peat. Could not penetrate further. Peat in this sample column is drier than at sites 1 to 3.	
	Site 5	
0 - 0.3	No sample, green moss.	
0.3 - 0.5	Chocolate brown, uniform amorphous peat. H5.	Medium brown, fine-textured brittle fibrous peat. 20% rootlets and reeds, 30% fine fibre remnants in humified matrix.
0.5	Brown sand with some admixed peat.	
	Site 6	
0 - 0.5	Many rootlets, no sample.	
0.5 - 1.25	Chocolate brown, fibrous peat with some admixed grass. H6.	Dark brown, fine-textured fibrous brittle peat. 20% reeds with 20% fine fibre remnants, some sphagnum. AD-7.9 VW-.12 Ash-7.9
1.25 - 1.6	Chocolate brown felty peat. H7.	Fine-textured dark brown hard peat. 10% reeds with 20% fine fibre remnants in humified matrix. AD-5.9 VW-.13 Ash-16.2
1.6 - 1.75	Clay-peat admixed.	
	Site 7	
0.5 - 1.5	Medium brown plastic peat. Very rooty. H6.	Medium brown fine-textured brittle peat. 10% rootlets, 15% reeds, 20% fine fibre remnants in humified matrix. AD-10.5 VW-.10 Ash-2.9
1.5	Point of rejection. Bottom?	
	Site 8	
0 - 0.3	No sample, surface moss.	
0.3 - 0.5	Coarse elastic light brown sphagnum. H1.	Coarse elastic light brown sphagnum. Good commercial quality. AD-8.1 VW-.09 Ash-6.3
0.5 - 1.75	Medium brown fibrous peat. H5.	Medium brown, fine-textured brittle fibrous peat. 10% reeds, 5% rootlets with 30 to 40% remnants in irregularly humified matrix. 0.5 - 1.0: AD-9.2 VW-.09 Ash-2.4 1.0 - 1.5: AD-11.1 VW-.08 Ash-2.8 1.5 - 1.75: AD-9.3 VW-.09 Ahs-6.0
1.75 - 2.5	Chocolate brown rooty amorphous peat. H6.	Dark brown fine-textured fibrous, brittle peat, 60% reeds and fine fibre residue in humified matrix. AD-13.5 VW-.07 Ash-6.6
2.5	Sand-peat mixture.	

Depth Metres		Dried Appearance and Laboratory Results
	Site 9	
0 - 0.3	No sample, green moss.	
0.3 - 0.5	Light brown peat with much admixed grass and roots. H4.	Porous, fibrous peat. Fine textured and brittle. 10% rootlets with 45% fine sphagnum remnants in irregularly humified matrix. AD-14.3 VW-.09 Ash-7.2
0.5 - 1.0	Medium brown peat with much admixed grass and roots. H7.	Porous, fibrous peat. Fine textured and brittle. Minor reeds, 10% rootlets and 35% fine sphagnum remnants in irregularly humified matrix. AD-8.9 VW-.10 Ash-2.5
1.0 - 1.6	As above but slightly less humified. H6.	As above with 5% rootlets, 15% reeds and 55% fine sphagnum fibre remnants in irregularly humified matrix. AD-10.2 VW-.07 Ash-2.3
1.6 - 2.3	As 1.0-1.6, somewhat greasy.	As 1.0-1.6 with 10% reeds and 65% fine fibre remnants in well humified matrix. AD-9.9 VW-.09 Ash-5.1
2.3 - 2.8	Chocolate brown, dense amorphous peat. H8.	Brownish black dense hard peat. Minor reeds and rootlets. 25% fine fibre remnants. AD-7.3 VW-.10 Ash-11.3
2.8	Bottom.	
	Site 10	
0 - 0.5	No sample, green moss.	
0.5 - 1.5	Medium to chocolate brown grassy peat. Admixed roots and grass. H5.	0.5-1.0: Medium brown, fibrous peat, hard. 20% reeds and 5% rootlets with 35% fine sphagnum remnants in humified matrix. AD-8.6 VW-.09 Ash-2.6 1.0-1.5: Dark brown, fibous peat, brittle. 10% reeds and 35% fine fibre remnants in humified matrix. AD-9.0 VW-.10 Ash-2.7
1.5 - 3.0	Medium to chocolate brown greasy, felty peat. H7.	1.5-2.0: As above, 5% rootlets, 15% reeds, 25% fine fibre remnants in humified matrix. AD-9.6 VW-.08 Ash-4.1 2.0-2.5: Dark brown, dense brittle peat. 10% reeds and rootlets with 25% fine fibre remnants in humified matrix. AD-11.3 VW-.10 Ash-6.3 2.5-3.0: Brownish black dense hard peat. 15% rootlets and reeds, 30% fine fibre remnants in humified matrix. AD-8.4 VW-.10 Ash-9.4
3.0 - 3.25	Dark brown granular peat. Greasy feel. H8.	As above. 15% rootlets and reeds, 25% fine fibre remnants in humified matrix. AD-6.5 VW-.12 Ash-17.9
3.25	Clay. Whole column is rooty.	
	Site 11	
0 - 0.5	No sample. Green moss and water.	
0.5 - 1.2	Light brown fibrous sphagnum with admixed water, roots and grass. H2.	Medium brown, medium-textured elastic sphagnum. 10% reeds and 80% fine fibre and sphagnum admixture. Fair commercial quality but would be dusty due to relatively short fibre length. AD-8.5 VW-.10 Ash-4.2
1.2	Sand.	
	Site 12	
0 - 0.6	No sample. Green moss.	
0.6 - 1.5	Medium brown felty peat with admixed grass, reeds, roots and wood chips. H4.	Medium brown fine-textured porous, fibrous brittle to elastic peat. 15% reeds

Depth Metres		Dried Appearance and Laboratory Results
		with 45% fine fibre and sphagnum remnants in irregularly humified matrix. AD-9.9 VW-.09 Ash-5.5
1.5 - 1.8	Medium brown peat with admixed grass, reeds, roots and wood chips. H6.	Medium brown fine-textured fibrous peat. Brittle. 20% reeds and rootlets, 30% fibre remnants in humified matrix. AD-9.7 VW-.09 Ash-4.3
1.8	Grey sandy clay.	
	Site 13	
0 - 0.75	No sample.	
0.75 - 1.5	Medium brown felty greasy peat admixed with grass. H5.	Dark brown fibrous peat, brittle. 25% fine fibre remnants and some sphagnum remnants in humified matrix. AD-9.6 VW-.08 Ash-4.4
1.5 - 2.6	Dark chocolate brown fine peat with admixed grass and roots. H7.	Dense, hard, dark brown peat. 15% reeds and rootlets, 25% fibre remnants in humified matrix. AD-10.3 VW-.09 Ash-5.0
2.6 - 2.8	As above with some admixed sandy clay.	As above, 10% fibre remnants. Some admixed clay. AD-1.9 VW-.41 Ash-80.6
	Site 14	
0 - 0.5	No sample. Green moss. Many roots.	
0.5 - 2.25	Chocolate brown felty peat. Greasy. H5.	Dark brown, fine-textured, fibrous peat, brittle. 10% rootlets and reeds, 45% fine fibre remnants and some sphagnum remnants in humified matrix. AD-9.5 VW-.09 Ash-2.4
2.25 - 3.1	Chocolate brown amorphous peat with some grass and roots. H6.	As above. Minor rootlets and reeds with 5% sphagnum remnants in amorphous matrix. AD-9.9 VW-.08 Ash-7.6
3.1 - 3.4	Chocolate brown greasy amorphous peat with some grass and roots. H9.	Brownish black, dense, hard peat. 5% rootlets, 10% fine fibre remnants in amorphous humified matrix. Could have some admixed clay. AD-4.0 VW-.20 Ash-19.9
3.4	Grey sandy clay.	
	Site 15	
0 - 0.6	No sample, green moss.	
0.6 - 1.5	Medium brown, felty peat. Very rooty.	Medium brown, fine-textured fibrous peat. Brittle. 15% rootlets and reeds, 50% fine fibre and sphagnum remnants in humified matrix. AD-10.0 VW-.09 Ash-4.7
1.5 - 2.3	Medium brown, fine-textured peat with admixed roots, rootlets and grass. H7.	Dark brown, fine-textured, fibrous peat. Brittle. 15% rootlets and reeds, 30% fine fibre remnants in humified matrix. AD-11.3 VW-.08 Ash-3.5
2.3 - 2.6	As above. H7.	As above. AD-9.6 VW-.09 Ash-5.6
2.6 - 2.8	Medium brown amorphous peat. No roots, rootlets or reeds. H9.	Brownish black, hard dense peat. 15% fibre remnants in humified matrix. AD-7.5 VW-.12 Ash-17.8
2.8 - 3.0	Brownish black plastic amorphous peat. H10.	As above. AD-3.5 VW-.23 Ash-NSS
3.0	Clay.	
	Site 16	
0 - 0.5	No sample, green moss.	
0.5 - 2.3	Chocolate brown, felty peat. Rooty.	Fine-textured, dark brown hard to brittle fibrous peat. 20% rootlets and reeds, 30% fine fibre remnants. AD-9.9 VW-.09 Ash-2.7

Depth Metres		Dried Appearance and Laboratory Results
2.3 - 2.4	Dark brown plastic amorphous peat. H8.	Fine-textured, brownish black hard dense peat. 25% fibre remnants and 10% rootlets and reeds in humified matrix. AD-7.6 VW-.11 Ash-24.4
2.4	Clay.	
	Site 17	
0 - 0.5	No sample, green moss.	
0.5 - 1.2	Medium brown peat. H5.	Fine-textured, dark brown hard fibrous to dense peat. 50% fine fibre remnants, 15% rootlets and reeds in humified matrix. AD-7.4 VW-.11 Ash-7.6
1.2 - 1.4	Dark brown plastic peat. H8.	Fine-textured, dense hard peat. Dark brown. 15% reeds and rootlets, 20% fine fibre remnants in humified matrix. AD-10.3 VW-.09 Ash-6.8
1.4	Grey sand.	
	Site 18	
0 - 0.5	No sample, green moss.	
0.5 - 0.9	Medium brown felty peat with grass, roots, and rootlets. H5.	Fine-textured, medium brown brittle, fibrous peat. 20% rootlets and reeds, 30% sphagnum remnants. AD-10.9 VW-.09 Ash-4.7
0.9	Sand.	
	Site 19	
0 - 0.6	No sample, moss.	
0.6 - 1.5	Medium brown, felty peat with grass and roots. H4.	Fine-textured, dark brown, brittle fibrous peat. 10% reeds and rootlets, 45% fine fibre remnants in humified matrix. AD-9.8 VW-.08 Ash-4.7
1.5 - 2.0	Chocolate brown felty peat with wood chips, roots and grass. H6.	As above. 10% reeds and rootlets, 35% fine fibre remnants. AD-7.4 VW-.10 Ash-7.6
2.0 - 2.8	Chocolate brown, amorphous peat. H8.	Fine-textured, dense hard peat. Dark brown. 5% reeds, 30% fibre remnants in humified matrix. AD-5.9 VW-.14 Ash-20.4
2.8	Bottom. Nature of soil not determined.	
	Site 20	
0 - 0.7	No sample. Green moss.	
0.7 - 1.1	Medium brown felty peat with grass and roots and water. H6.	Dark brown, fine-textured brittle fibrous peat. 65% fine fibre and sphagnum remnants, 5% reeds and roots in humified matrix. AD-8.9 VW-.09 Ash-7.9
1.1 - 1.4	Dark brown amorphous plastic peat-clay. H9.	Brown peat clay mixture. AD-1.9 VW-.45 Ash-75.9
1.4	Clay.	

Deposit 28: Cathcart Township

	Site 1	
0 - 0.5	No recovery.	
0.5 - 1.0	Dark brown peat. A few residual fibres and reeds. H8.	Fine-grained, medium dark brown, hard peat. AD-2.05 VW-.362 Ash-44.2
1.0	Point of rejection. Very compact clay, peat or a root.	
	Site 2	
0 - 0.5	No recovery.	
0.5 - 1.5	Dark brown peat with residual reeds and sedgy fibres.	Fine-grained dark brown brittle peat.

Depth Metres		Dried Appearance and Laboratory Results
	H5.	20% fine fibres, reeds and rootlets, remainder humified. 0.5-1.0: AD-7.17 VW-.098 Ash-4.41 1.0-1.5: AD-5.05 VW-.147 Ash-4.53
1.5 - 1.75	Dark brown peat with sedgy fibres preserved. H8.	Fine-grained dark brown to black hard peat, 15% fine fibres and reeds preserved. AD-3.84 VW-.253 Ash-39.3 High ash due to contamination from underlying clay.
1.75 - 8.0	Black clay.	
	Site 3	
0 - 0.5	No recovery.	
0.5 - 0.75	Dark brown peat with 30 to 40% fibres preserved. H8.	Medium brown, fine- to medium-grained light brittle peat containing 10% sphagnum fibres and 20% reeds. AD-4.40 VW-.172 Ash-6.24
0.75 - 1.0	Light brown fresh sphagnum. H2.	Light brown coarse elastic sphagnum. Good commercial quality. AD-16.31 VW-.050 Ash-9.89
1.0 - 1.25	Dark brown peat with a few sedgy remnants. H9.	Fine-grained dark brown brittle peat. 20% reed remnants preserved. AD-5.60 VW-.141 Ash-5.0
1.25	Sandy clay.	
	Site 4	
0 - 0.5	No recovery.	
0.5 - 1.0	Dark brown fibrous peat. Fibres mainly sedge and reeds. H7.	Uniformly humified dark brown fine-grained brittle peat, 20 to 30% fibres preserved. AD-6.31 VW-.120 Ash-NSS
1.0 - 1.25	As above but moister. 2 cm at bottom amorphous peat.	Medium dark brown fine-grained hard peat, 20% fibres preserved. AD-4.73 VW-.173 Ash-6.92
1.25 - 1.5	Amorphous peat. H9.	Medium dark brown very fine grained brittle peat with 25% fine fibre remnants. AD-7.38 VW-.104 Ash-6.70
1.5 - 1.75	Dry, dense, compact peat. H9+.	Dark grey-brown hard heavy peat. 10% rootlets and reed remnants. Only a trace of fibre. AD-3.65 VW-.203 Ash-NSS
1.75	Peat too compact to penetrate further.	

Deposit 29: Meinzinger Township

	Site 1	
0 - 0.2	No sample. Green moss.	
0.2 - 1.4	Dark brown peat. Felty fibre residues in amorphous matrix. Rooty. Becomes denser with depth. H7.	Dark brown, fine-textured brittle peat. 20% reeds, 25% fibre remnants with some sphagnum remnants. AD-7.2 VW-.13 Ash-8.2
1.4	Grey plastic clay.	
	Site 2	
0 - 0.25	No sample. Green moss.	
0.25 - 0.5	Dark brown, fibrous. Admixed water. H3.	Dark brown, fine-textured elastic to brittle sedge and sphagnum. Marginal quality. Would be heavy and dusty. AD-6.4 VW-.12 Ash-NSS
0.5 - 2.0	Dark brown felty peat. Greasy feel. H6.	Fine-textured, dark brown brittle peat. 15% rootlets and reeds, 40% fibre remnants in irregularly humified matrix. AD-7.8 VW-.11 Ash-10.5
2.0	Black sandy clay.	

Depth Metres		Dried Appearance and Laboratory Results
	Site 3	
0 - 0.3	No sample. Green moss.	
0.3 - 0.5	Sphagnum. 20% reeds and rootlets. Much water. H3.	Medium- to coarse-textured elastic sphagnum. 15% rootlets and reeds, 75% sphagnum fibre. Light brown. Commercial quality. AD-11.1 VW-.08 Ash-9.5
0.5 - 0.7	Plastic, thick peat. 20% rootlets. Water. H6.	Dark brown, medium-textured brittle fibrous peat. 10% reeds, 45% sphagnum remnants in humified matrix. AD-7.5 VW-.12 Ash-9.0
0.7 - 1.5	As above, becoming more compact with depth. Some excess water. H6.	As above. 15% reeds and rootlets, 35% fibre remnants. AD-7.8 VW-.13 Ash-4.6
1.5 - 1.75	Dry, grey-brown, compact peat. H7.	As above but brownish black. 20% H5 reeds, 30% fibre remnants in humified matrix. AD-7.7 VW-.11 Ash-9.7
1.75 - 2.0	Saturated brownish grey silty sand.	
	Site 4	
0 - 0.2	Medium brown sphagnum with 20% reeds. H3.	Light brown medium-textured elastic sphagnum, 20% reeds and rootlets. AD-7.6 VW-.11 Ash-7.8
0.2 - 0.3	Transition.	Fine-textured dark brown fibrous peat. Brittle. 20% rootlets and reeds, 25% fibre remnants in humified matrix. AD-6.9 VW-.13 Ash-8.6
0.3 1.75	Dark brown, moist, slightly felty peat. H7.	Fine-textured hard dense peat. 35% fibre remnants, roots and reeds. AD-7.0 VW-.12 Ash-6.9
1.75 - 2.25	More plastic and finer textured peat than above. H8.	Brownish black, hard dense peat. 10% fibre remnants, 15% rootlets and reeds. AD-8.0 VW-.13 Ash-9.3
2.25	Light grey sand.	
	Site 5	
0 - 0.3	No sample, green moss.	
0.3 - 2.25	Dark brown, moist, felty peat. Becomes progressively drier to 1.5. H5.	Dark brown, fine-textured, brittle, fibrous peat. 10% rootlets and reeds, 70% fibre remnants in humified matrix. AD-7.4 VW-.12 Ash-7.9
2.25	Sandy clay.	
	Site 6	
0 - 0.4	No sample, green moss.	
0.4 - 0.5	Sphagnum. H4.	
0.5 - 1.75	Uniform moist felty peat. H5.	Dark brown, fine-textured, brittle sedge peat. 15% rootlets and reeds, 40% fibre remnants. Some sphagnum remnants. Humified matrix. AD-7.2 VW-.11 Ash-5.6
1.75 - 2.5	Fibours sphagnum peat. Water.	As above, sphagnum peat. AD-8.1 VW-.11 Ash-8.1
2.5 - 3.0	As 0.5-1.75. H5.	As 0.5-1.75. AD-9.0 VW-.10 Ash-10.7
3.0 - 3.5	As 1.75-2.5. H5.	As 1.75-2.5. AD-8.8 VW-.09 Ash-9.1
3.5 - 4.0	As 0.5-1.75. H5.	As 0.5-1.75. AD-9.4 VW-.11 Ash-9.5
4.0 - 4.3	Fibrous hypnum. H4.	Medium textured, brownish black elastic to brittle. Fair quality but would be dusty and heavy. Well preserved fronds. AD-10.3 VW-.09 Ash-13.4
4.3	Bottom.	
	Site 7	
0 - 0.35	No sample, green moss.	
0.35 - 2.0	Dark brown, felty peat. Water. Rooty section 1.0-1.5. H6.	Dark brown, brittle peat. Fine-textured. 10% rootlets and reeds, 45% fibre remnants in humified matrix. AD-8.3 VW-.10

Depth Metres		Dried Appearance and Laboratory Results
2.0 - 3.1	Lighter brown, fibrous peat. Water. H6.	Ash-10.2 Brownish black, fine-textured brittle peat. 5% rootlets and reeds in humified matrix. AD-9.8 VW-.09 Ash-11.3
3.1	Brownish grey loam.	
	Site 8	
0 - 0.5	No sample, green moss.	
0.5 - 2.7	Felty, uniform peat. Admixed grass roots to 1.0. Root layer 1.0-1.5. H5.	Brown, fine-textured brittle fibrous peat. 15% rootlets and reeds. 50% fine fibre remnants in humified matrix. AD-8.0 VW-.11 Ash-6.9
2.7 - 2.75	Sand.	
	Site 9	
0 - 0.25	No sample, green moss.	
0.25 - 0.35	Sphagnum moss with 10% grass and rootlets. H3.	Light brown, medium-fibred elastic sphagnum. Commercial quality. AD-11.2 VW-.08 Ash-NSS
0.35 - 1.0	Medium to dark brown felty sphagnum peat. 20% grass and rootlets. H4-H5.	Medium brown, fibrous brittle porous peat. 15% rootlets, grass and reeds, 60% fibre remnants in irregularly humified matrix. AD-9.4 VW-.10 Ash-6.0
1.0 - 1.95	Dark brown peat. Root layer 1.0-1.5. H6.	Dark brown, fine-textured brittle fibrous peat. 15% rootlets and reeds, 25% fibre remnants in humified matrix. AD-8.5 VW-.10 Ash-7.1
1.95 - 2.0	Black plastic clay.	
	Site 10	
0 - 0.4	No sample, green moss.	
0.4 - 0.5	Sphagnum. H3.	
0.5 - 1.25	Fibrous, felty, greasy peat. H6.	Dark brown, fine-textured brittle, fibrous peat. 15% rootlets and reeds. 35% fibre remnants in humified matrix. AD-6.4 VW-.13 Ash-12.6
1.25 - 1.3	Sandy clay.	

APPENDIX II
LABORATORY METHODS

JOB NO. 77-1170

PEAT MOSS EVALUATION

Tests on 170 samples of peat moss, from bogs located in the Townships of Gibbard, Lyon, Meinzinger, McNevin and Trewartha, all in the Thunder Bay area, were carried out in this laboratory. The following data were obtained:

1) Absorptive value
   a) Calculated on a dry weight basis.
   b) Calculated on a 40% moisture content.
2) Saturated volume weights (Bulk Densities) gms/cc.
   a) As received.
   b) Oven dried.
   c) Wet.
3) Density of dried peat moss (gm/cc).
4) Acidity.
5) Moisture - as received.
6) Ash - as a percent of dried sample.

All data are tabulated on attached sheets.

PROCEDURE:

Absorptive Value and Bulk Density

The test procedure is essentially the same as that described in the ASTM D2980-71; our procedure differed from the ASTM methods in that samples were not passed through a sieve prior to testing and they were thoroughly soaked before being transferred to the burettes. A small 20 mesh screen was fitted at the bottom of each burette to prevent loss of sample during the draining period.

Laboratory Procedure

A portion of each sample (30 to 40 gms) was weighed as received (W_R). It was soaked in water for 24 hours and then transferred to a tared burette which was filled to the top with water. The burette was allowed to drain by opening a pinch cock.

When completely drained, the peat moss remained in the burette with its absorbed water. The weight (W_W) and the volume of the saturated peat moss were then measured (V_W).

The wet peat moss was removed from the burette by pushing upward on the 20 mesh screen on which it was resting. It emerged as a cylindrically shaped body which was placed in an oven at 105°C until completely dry. Its volume (V_D) and weight (W_D) were again determined.

Using the data obtained above, a number of features characteristic of the peat moss were compiled and tabulated. These consist of:

I - Absorptive Value:

This is a measure of the water retention ability of the peat moss. It is a ratio of the weight of retained water over the dry weight of the peat moss. Two values are given in the tables.

(1) Dry basis - $\frac{W_W - W_D}{W_D}$

(2) 40% moisture content -

$$\frac{W_W - W_D}{W_D} \times \frac{60}{100} - \frac{40}{100}$$

II - Saturated Volume/Weight:

Using the saturated volume as a common denominator, the so-called saturation volume weights were obtained. These are a measure of bulk density under three conditions.

(a) As Received $\frac{W_R}{V_W}$ gms/cc

(b) Oven Dried $\frac{W_D}{V_W}$ gms/cc

(c) When Wet $\frac{W_W}{V_W}$

III - Dry Density:

W_D/V_D - is a useful measure of the shrinkage and hence an indication of the degree of humification. However, inorganic impurities such as clay or sand will have a marked effect on the dry density.

IV - Acidity:

5 grams of sample were mixed with 20 ml of distilled water, soaked for 30 minutes, and the pH value was read with a pH meter.

V - Moisture:

The procedure follows that of ASTM D2947-71, approximately 10 grams of sample "as received" were weighed on a tared beaker, dried at 105°C to constant weight, and weighed again. The percent moisture was then calculated.

VI - Ash:

The dried sample was placed in a muffle furnace at a temperature of 750°C. The amount of ash was calculated as a percent of the dried sample.

Comments

The tabulated data indicates a generally poor quality of peat moss for agricultural purposes.

Previous reports (C-17887, Dec. 15/75) suggested that peat moss with a dry density of 0.2 gm/cc (W_D/V_D) or less, and an absorptive value greater than 8 (dry basis) could have a potential value in agriculture.

Of the 170 samples studied only 16 met the above criteria. These were:

Lab No.	Deposit No.	Township
137	23	Gibbard
45	15	Lyon
118	16	Lyon
83	29	Meinzinger
97	29	Meinzinger
101	29	Meinzinger
12	27	McNevin
15	27	McNevin
16	27	McNevin
17	27	McNevin
21	27	McNevin
22	27	McNevin
67	25	Trewartha
70	25	Trewartha
58	25	Trewartha
66	25	Trewartha

Most of the 170 samples of dried peat moss were dark in colour and lacking in abundant fibrous material or porosity. A notable exception was that taken from Lyon Township (Lab Sample No.45).

Most of the peat moss appears to have undergone some degree of humification.

APPENDIX III
LABORATORY RESULTS

Deposit and Sample Site	Moisture percent	Ash percent	pH	Absorptive Value dry (X own wt)	Absorptive Value 40 percent Moisture	Saturated Volume Weights-gm/cc			Dry Volume Wt.gm/cc
						As recovered Wr/Vw	Oven Dried Wd/Vw	Wet Ww/Vw	Wd/Vd
1: SPRINGER TP.									
Site 5									
0.45 - 1.1 m	90.6	0.8	4.75	9.0	5.0	0.88	0.09	0.87	0.10
1.3 - 1.8 m	89.2	2.5	5.05	7.7	4.2	1.01	0.09	0.77	0.43
1.8 - 2.3 m	92.5	1.5	5.35	7.1	3.7	1.24	0.10	.80	0.43
Site 6									
0.9 - 2 m	87.7	8.0	6.10	7.1	3.9	0.84	0.11	0.87	0.26
2: LOUDON TP.									
Site 4									
0.6 - 0.7 m	90.3	3.8	5.40	6.2	3.3	1.00	0.11	0.81	0.44
0.7 - 1.5 m	90.0	4.8	6.05	11.9	6.7	0.87	0.08	1.03	0.58
1.5 - 1.75 m	91.4	21.0	5.75	8.4	4.6	1.21	0.09	0.86	0.21
Site 5									
0.3 - 1.5 m	89.5	6.2	5.88	8.7	4.8	1.19	0.11	1.03	0.33
1.5 - 1.75 m	92.3	6.7	5.20	13.7	7.8	0.90	0.07	1.09	0.27
Site 6									
1 - 1.75 m	93.4	5.5	6.40	10.8	6.1	0.85	0.06	0.67	0.20
1.75 - 2 m	89.5	4.9	5.95	6.4	3.4	1.20	0.12	0.92	0.30
3: STREET TP.									
Site 1									
0.3 - 0.75 m	92.9	7.4	5.70	8.9	4.94	1.31	0.10	1.00	0.21
1 - 1.3 m	92.7	7.1	5.45	12.6	7.2	0.92	0.06	0.77	0.20
Site 2									
0.2 - 0.6 m	92.3	5.3	5.50	12.3	7.0	1.07	0.06	0.81	0.20
0.6 - 1.5 m	92.9	4.3	5.10	10.8	6.1	1.34	0.08	0.95	0.16
1.5 - 2.8 m	86.2	28.0	5.73	8.0	4.4	0.92	0.09	0.80	0.33
Site 3									
0.2 - 1.3 m	92.6	8.2	5.10	12.2	6.9	0.97	0.06	0.82	0.18
1.3 - 2 m		9.8		7.1					0.17
4: STREET TP.									
Site 4									
0.2 - 1.7 m	92.3	2.8	3.40	6.5	3.5	0.92	0.11	0.84	0.32
1.7 - 2 m	93.5	2.7	4.70	10.0	5.6	0.56	0.04	0.39	0.29
2 - 2.5 m	87.9	6.1	4.20	8.5	4.7	0.60	0.07	0.69	0.34
Site 5									
0.1 - 0.3 m	87.3	3.3	3.40	10.6	6.0	0.61	0.08	0.89	0.15
0.5 - 1.5 m	90.4	1.8	5.20	15.6	9.0	1.03	0.08	1.27	0.26
1.5 - 2.5 m	88.3	4.8	5.60	6.7	3.6	0.73	0.09	0.69	0.46
5: CAPREOL TP.									
Site 3									
0.06 - 0.5 m	87.2	4.1	5.40	7.5	4.1	1.06	0.14	1.24	0.23
0.5 - 0.7 m	85.0	7.4	5.75	6.1	3.3	0.97	0.13	0.94	0.25
Site 4									
0 - 0.4 m	92.6	4.7	5.30	10.3	5.8	1.10	0.08	0.90	0.11
0.4 - 0.7 m	83.6	7.9	5.50	7.1	3.9	0.81	0.13	1.02	0.28

							Saturated Volume Weights-gm/cc		Dry Volume Wt.gm/cc
Deposit and Sample Site	Moisture percent	Ash percent	pH	Absorptive Value dry (X own wt)	Absorptive Value 40 percent Moisture	As recovered Wr/Vw	Oven Dried Wd/Vw	Wet Ww/Vw	Wd/Vd
Site 5									
0 - 0.3 m	91.1	5.3	5.10	8.5	4.7	1.13	0.09	0.84	0.16
0.3 - 2 m	85.8	22.0	5.60	5.9	3.1	0.98	0.12	0.84	0.38
6: CAPREOL TP.									
Site 3									
0 - 0.3 m	89.4	10.6	4.35	9.0	5.0	0.91	0.10	0.98	0.13
0.3 - 1.8 m	70.9	4.0	5.60	8.0	4.4	0.98	0.10	0.92	0.25
7: HALLAM TP.									
Site 5									
0 - 0.3 m	90.9	20.2	5.20	17.4	10.0	1.08	0.06	1.17	0.07
0.3 - 2.5 m	93.2	5.6	6.00	7.9	4.3	1.20	0.11	0.92	0.36
2.5 - 4.25 m	96.0	4.1	6.10	12.8	7.3	1.20	0.06	0.80	0.21
8: GALBRAITH TP.									
Site 1									
0 - 0.3 m	92.5	1.9	4.70	23.2	13.5	0.75	0.06	1.35	0.09
1 - 1.5 m	NSS	NSS	5.40	5.3	2.8	0.98	0.13	0.81	0.41
1.5 - 3 m	93.6	4.3	5.55	10.6	6.0	1.03	0.07	0.80	0.21
3 - 4 m	92.5	4.6	6.05	7.8	4.3	1.41	0.10	0.90	0.48
4 - 5 m	94.0	9.3	6.55	14.4	8.2	1.41	0.09	1.41	0.48
5 - 5.25 m	90.2	45.0	6.60	8.6	4.8	0.96	0.09	0.89	0.62
Site 2									
0.2 - 0.4 m	93.1	5.2	5.25	14.3	8.2	0.98	0.06	0.96	0.16
1 - 2.5 m	92.4	3.6	5.55	11.6	6.6	1.70	0.13	1.61	0.26
2.5 - 3 m	91.6	7.0	6.25	12.1	6.9	1.25	0.07	0.92	0.16
3 - 4 m	93.5	44.2	6.50	9.3	5.2	0.86	0.08	0.82	0.48
Site 3									
0.3 - 0.5 m	92.7	3.6	5.40	19.5	11.3	1.30	0.09	1.81	0.33
0.5 - 1.5 m	93.0	2.3	5.40	10.5	5.9	1.16	0.07	0.84	0.25
1.5 - 2.8 m	94.7	4.6	6.40	13.3	7.6	0.88	0.05	0.76	0.18
3 - 3.25 m	90.7	33.0	6.80	16.4	9.4	1.63	0.15	2.61	0.39
3.25 - 6 m	90.4	52.3	6.90	9.2	5.1	1.00	0.09	0.95	0.42
11: FENWICK TP.									
Site 1									
0.2 - 0.6 m	85.9	18.7	5.20	5.0	2.6	0.94	0.16	0.93	0.88
Site 2									
0.2 - 0.5 m	84.8	8.6	5.25	4.9	2.5	1.05	0.16	0.94	0.46
Site 3									
0.1 - 0.7 m	88.8	14.0	6.05	5.4	2.8	1.08	0.21	1.32	0.79
Site 4									
0.3 - 0.5 m	85.0	16.3	5.80	4.6	2.4	0.93	0.16	0.91	0.64
13: LYON TP.									
Site 1									
0.4 - 1.9 m	91.7	6.1	5.4	7.6	4.2	1.33	0.09	0.90	0.21
Site 2									
0.3 - 2.3 m	92.0	7.1	5.5	7.9	4.3	1.22	0.10	0.88	0.22
Site 3									
0.3 - 2.3 m	90.7	9.7	5.8	7.1	3.9	1.27	0.11	0.92	0.28

Deposit and Sample Site	Moisture percent	Ash percent	pH	Absorptive Value dry (X own wt)	Absorptive Value 40 percent Moisture	As recovered Wr/Vw	Saturated Volume Weights-gm/cc		Dry Volume Wt.gm/cc
							Oven Dried Wd/Vw	Wet Ww/Vw	Wd/Vd
Site 4									
0.2 - 2.2 m	92.3	9.3	5.6	6.7	3.6	1.60	0.12	0.91	0.29
Site 5									
0.15 - 2.2 m	89.8	7.5	5.2	7.3	4.0	1.39	0.11	0.90	0.29
Site 6									
0.3 - 1.95 m	90.4	7.1	5.7	7.9	4.3	1.46	0.12	1.06	0.26
15: LYON TP.									
Site 1									
0.5 - 1.0 m	93.1	4.7		10.3	5.8	1.15	0.09	0.97	0.24
1.0 - 1.5 m	92.6	6.6	5.9	10.7	6.0	1.08	0.07	0.87	0.22
1.5 - 2.0 m	92.4	9.1	5.8	8.5	4.7	1.37	0.10	0.95	0.26
Site 5									
0.5 - 1.0 m	93.6	6.1	5.7	10.7	6.0	1.29	0.08	0.93	0.25
1.0 - 1.5 m	93.0	6.1	5.9	12.0	6.8	1.16	0.07	0.94	0.28
1.5 - 2.0 m	91.5	7.7		9.0	5.0	1.36	0.09	0.86	0.23
Site 12									
0.5 - 1.0 m	88.6	6.8		9.1	5.1	1.04	0.09	0.95	0.32
1.0 - 1.5 m	89.9	15.3	6.0	5.0	2.6	1.17	0.15	0.92	0.47
16: LYON TP.									
Site 1									
0.3 - 0.5 m	91.1	11.0		5.8	3.1	1.36	0.11	0.72	0.24
0.5 - 1.0 m	89.6	10.0	6.1	5.0	2.6	1.50	0.17	1.04	0.31
1.0 - 1.6 m	88.0	12.2	6.1	5.6	3.0	1.27	0.15	0.95	0.28
Site 2									
0.3 - 0.5 m	87.8	10.2		8.7	4.8	1.14	0.11	1.11	0.21
0.5 - 1.5 m	88.9	10.2	6.1	6.5	3.5	1.14	0.15	1.14	0.33
Site 3									
0.4 - 0.5 m	84.9	8.9		5.8	3.1	1.15	0.14	0.95	0.31
0.5 - 1.0 m	86.9	10.5	6.0	5.5	2.9	1.21	0.14	0.94	0.26
Site 4									
0.4 - 0.5 m	82.8	7.3		9.5	5.3	0.75	0.09	0.95	0.20
0.5 - 1.5 m	89.2	11.1	6.0	7.8	4.3	1.04	0.10	0.91	0.25
Site 5									
0.4 - 2.0 m	89.3	8.1	5.8	6.9	3.7	1.15	0.12	0.92	0.28
Site 6									
0.25 - 1.5 m	91.6	7.4	5.5	8.9	4.9	1.29	0.09	0.93	0.31
1.5 - 1.8 m	91.1	12.6	5.8	8.8	4.9	1.31	0.10	0.99	0.32
Site 7									
0.3 - 1.0 m	89.5	9.4	5.7	7.4	4.0	1.16	0.11	0.91	0.27
1.0 - 1.6 m	89.1	12.2	6.2	7.8	4.3	1.20	0.13	1.14	0.43
18: CONACHER TP.									
Site 1									
0.5 - 2.5 m	88	6.16	5.12	5.04	2.62	0.913	0.154	0.934	0.33
Site 2									
0.4 - 1.5 m	88	5.79	5.10	8.20	4.52	0.997	0.108	0.977	0.34
1.5 - 2.45 m	87	9.72	6.14	4.90	2.54	0.853	0.128	0.757	0.34

Deposit and Sample Site	Moisture percent	Ash percent	pH	Absorptive Value dry (X own wt)	Absorptive Value 40 percent Moisture	As recovered Wr/Vw	Saturated Volume Weights-gm/cc		Dry Volume Wt.gm/cc
							Oven Dried Wd/Vw	Wet Ww/Vw	Wd/Vd
Site 3									
0.25 - 2.4 m	85	14.7	5.55	3.13	1.47	0.934	0.216	0.890	0.54
21: FALLIS TP.									
Site 1									
0.28 - 1.75 m	87	7.34	6.20	4.77	2.46	0.971	0.148	0.860	0.25
Site 2									
0.65 - 1.0 m	89	8.42	5.80	5.45	2.87	0.891	0.113	0.735	0.36
1.0 - 1.5 m	87	10.2	5.92	5.62	2.97	0.976	0.134	0.890	0.20
1.5 - 2.5 m	88	8.0	6.15	5.82	3.09	0.968	0.128	0.870	0.23
2.5 - 3.0 m	91	5.84	6.20	8.29	4.57	0.961	0.085	0.794	0.20
Site 3									
0 - 0.2 m	65	78.0	6.43	7.27	3.96	0.894	0.100	0.828	0.21
Site 4									
0.1 - 1.2 m	82	32.4	5.65	2.60	1.16	1.025	0.264	0.931	0.74
22: GIBBARD TP.									
Site 1									
0.5 - 3.9 m	91.5	11.8	6.3	8.2	4.5	1.33	0.10	0.95	0.32
Site 2									
0.5 - 3.6 m	91.3	9.5	6.3	7.2	3.9	1.51	0.12	0.95	0.33
Site 3									
0.4 - 3.5 m	91.2	9.1	5.8	7.7	4.2	1.24	0.11	0.96	0.29
Site 4									
0.6 - 3.5 m	90.8	8.6	6.0	7.3	4.0	1.13	0.11	0.93	0.29
3.5 - 4.0 m	88.7	14.9	6.7	7.7	4.2	1.15	0.12	1.06	0.33
23: GIBBARD TP.									
Site 1									
0.2 - 1.0 m	94.1	10.3	5.3	8.3	6.6	1.54	0.10	0.90	0.25
1.0 - 2.2 m	91.6	6.6	5.7	8.6	4.8	1.17	0.10	0.93	0.29
Site 2									
0.4 - 2.3 m	90.8	7.8	5.7	8.1	4.5	1.23	0.11	1.01	0.25
2.3 - 2.8 m	80.3	27.8	5.6	3.3	1.6	1.13	0.26	1.14	0.64
Site 3									
0.25 - 2.0 m	91.9	1.9	4.8	9.4	5.2	1.07	0.09	0.94	0.22
2.0 - 2.3 m	92.2	3.4	5.2	11.8	6.7	0.98	0.08	0.97	0.27
2.3 - 4.0 m	93.9	4.5	5.8	10.5	5.9	1.13	0.09	1.01	0.27
Site 4									
0.3 - 0.5 m	NSS	NSS	NSS	9.7	5.4	1.17	0.09	0.92	0.20
0.5 - 1.9 m	88.1	4.0	4.7	6.1	3.3	1.01	0.14	0.98	0.37
Site 5									
0.5 - 2.4 m	87.8	6.8	5.8	6.1	3.3	1.04	0.13	0.92	0.28
Site 6									
0.2 - 0.9 m	85.6	17.7	5.8	6.5	3.5	1.13	0.12	0.92	0.28
Site 7									
0.6 - 1.4 m	89.4	12.4	5.5	6.1	3.3	1.10	0.13	0.90	0.28

Deposit and Sample Site	Moisture percent	Ash percent	pH	Absorptive Value dry (X own wt)	Absorptive Value 40 percent Moisture	As recovered Wr/Vw	Saturated Volume Weights-gm/cc		Dry Volume Wt.gm/cc
							Oven Dried Wd/Vw	Wet Ww/Vw	Wd/Vd
24: STEDMAN TP.									
Site 1									
0.5 - 1.5 m	91	13.4	5.39	7.46	4.07	1.101	0.103	0.875	0.22
1.5 - 2.0 m	92	9.81	5.36	9.11	5.06	1.042	0.095	0.970	0.25
Site 2									
0.25 - 1.5 m	90	34.8	6.33	4.86	2.51	1.021	0.148	0.870	0.39
Site 3									
0.3 - 0.5 m	89	7.15	4.90	3.62	1.77	1.028	0.205	0.940	0.50
0.5 - 1.5 m	89	6.52	4.98	6.35	3.41	0.977	0.120	0.899	0.38
1.7 - 2.4 m	90	12.9	5.48	8.31	4.58	0.800	0.096	0.902	0.23
Site 4									
0.25 - 1.52 m	91	8.73	5.60	7.35	4.01	1.362	0.084	0.708	0.22
1.52 - 2.5 m	92	10.0	6.12	5.09	2.65	0.976	0.148	0.903	0.29
2.5 - 3.25 m	90	33.6	5.85	7.00	3.80	1.017	0.111	0.890	0.34
Site 5									
0.1 - 2.0 m	91	9.11	5.45	8.37	4.62	0.979	0.087	0.817	0.25
2.0 - 4.7 m	91	11.8	5.28	8.95	4.97	1.147	0.108	1.077	0.27
Site 6									
0.25 - 0.45 m	93	4.35	5.29	6.83	3.69	1.236	0.136	1.068	0.33
0.45 - 3.0 m	93	2.33	4.97	14.28	8.16	1.124	0.063	0.975	0.22
3.0 - 4.0 m	92	8.61	4.85	9.90	5.54	0.999	0.081	0.892	0.38
4.0 - 4.7 m	90	11.4	5.21	6.60	3.56	0.867	0.125	0.952	0.49
Site 7									
1.2 - 1.7 m	93	2.26	4.91	13.84	7.90	0.879	0.051	0.771	0.15
1.7 - 2.0 m	93	2.68	5.45	10.19	5.71	1.127	0.076	0.850	0.24
2.0 - 2.5 m	NSS	NSS	NSS	13.65	7.79	1.329	0.053	0.783	0.14
2.5 - 4.7 m	95	4.85	5.65	10.74	6.04	1.019	0.063	0.744	0.20
Site 8									
0.45 - 3.0 m	94	4.28	5.11	13.13	7.47	1.082	0.063	0.903	0.25
3.0 - 3.5 m	92	4.29	4.78	10.11	5.66	0.895	0.078	0.874	0.16
3.5 - 5.5 m	92	5.61	6.00	9.14	5.08	1.133	0.090	0.916	0.33
5.5 - 5.95 m	77	49.2	5.42	3.14	1.88	0.787	0.226	0.930	0.64
Site 9									
0.5 - 2.5 m	93	3.73	4.86	11.62	6.57	1.005	0.067	0.848	0.15
2.5 - 2.75 m	92	3.39	4.72	9.47	5.28	0.856	0.080	0.839	0.19
2.75 - 3.5 m	91	6.08	5.25	8.00	4.40	0.907	0.094	0.875	0.30
25: TREWARTHA TP.									
Site 2									
0.5 - 1.5 m	89.6	9.4	4.9	8.3	4.6	1.00	0.09	0.87	0.23
Site 3									
1.0 - 1.5 m	88.2	13.0	4.6	8.8	4.9	1.03	0.10	1.02	0.55
Site 4									
0.5 - 1.0 m	NSS	NSS	NSS	5.7	3.0	0.79	0.11	0.75	0.36
Site 5									
0.5 - 0.75 m	63.0	14.9		3.7	1.8	0.88	0.23	1.06	0.64

Deposit and Sample Site	Moisture percent	Ash percent	pH	Absorptive Value dry (X own wt)	Absorptive Value 40 percent Moisture	As recovered Wr/Vw	Saturated Volume Weights-gm/cc		Dry Volume Wt.gm/cc
							Oven Dried Wd/Vw	Wet Ww/Vw	Wd/Vd
Site 7									
0.3 - 0.5 m	NSS	NSS	NSS	6.4	2.8	0.73	0.14	0.88	0.40
Site 9									
1.0 - 1.25 m	NSS	NSS	NSS	6.4	3.0	0.85	0.12	0.82	0.29
1.25 - 1.75 m	87.3	4.2	4.6	3.5	3.4	1.03	0.13	0.94	0.26
Site 10									
1.0 - 1.15 m	88.1	5.4	5.1	8.4	4.6	0.81	0.10	0.96	0.29
1.15 - 1.25 m	54.6	82.0	6.4	3.9	1.9	1.04	0.22	1.06	0.58
Site 11									
0.5 - 1.4 m	92.4	3.2	5.1	9.3	5.2	1.18	0.09	0.92	0.30
1.4 - 1.6 m	84.9	2.4		7.1	3.9	0.92	0.13	1.05	0.54
Site 12									
0.5 - 1.5 m	90.8	5.6	5.2	9.1	5.1	1.00	0.09	0.91	0.38
1.5 - 1.9 m	88.4	15.3	5.5	7.5	4.1	1.00	0.12	1.02	0.46
Site 13									
1.0 - 1.2 m	94.1	5.9	5.1	12.4	7.0	1.26	0.07	0.95	0.20
1.2 - 1.4 m	92.8	2.5	5.0	7.5	4.1	1.38	0.12	1.02	0.30
Site 14									
0.5 - 1.6 m	92.4	3.8	4.9	9.6	5.4	1.28	0.10	1.02	0.34
1.6 - 1.8 m	88.6	10.0		6.1	3.3	1.05	0.16	1.10	0.74
Site 15									
0.2 - 2.1 m	88.2	5.1	4.8	8.8	4.9	1.00	0.10	0.98	0.30
Site 16									
1.7 - 2.6 m	90.8	8.1	5.4	8.7	4.8	1.01	0.10	0.93	0.57
2.6 - 4.0 m	93.2	7.2	5.4	9.2	5.1	1.44	0.09	0.97	0.32
4.0 - 4.25 m	NSS	NSS	NSS	16.1	9.3	0.83	0.05	0.83	0.15
Site 17									
0.6 - 4.25 m	92.3	6.0	5.6	8.4	5.6	1.54	0.11	1.02	0.35
4.25 - 4.75 m	87.7	44.7	4.7	5.5	2.9	1.26	0.16	1.04	0 42
Site 18									
1.0 - 3.5 m	94.2	5.2	5.4	9.8	5.5	1.25	0.10	1.08	0.37
3.5 - 4.1 m	90.4	15.9	5.2	9.4	5.2	1.31	0.11	1.12	0.43
Site 19									
1.5 - 4.0 m	92.8	5.7	5.0	11.2	6.3	1.18	0.08	0.99	0.28
4.0 - 4.25 m	90.1	8.5	5.2	7.9	4.3	1.07	0.11	0.96	0.36
Site 20									
0.4 - 3.9 m	91.5	3.8	4.7	9.0	5.0	1.13	0.11	1.07	0.33
3.9 - 4.0 m	NSS	NSS	NSS	4.7	2.4	0.93	0.18	1.04	0.54
Site 21									
0 - 0.5 m	92.5	11.4	5.2	13.1	7.5	0.99	0.07	0.92	0.10
2.0 - 3.4 m	93.3	2.4	5.3	10.3	5.8	1.43	0.09	0.96	0.34
3.5 - 3.75 m	NSS	NSS	NSS	8.5	4.7	1.46	0.09	0.90	0.21
4.5 - 4.7 m	89.9	11.5	5.4	6.8	3.7	1.16	0.12	0.98	0.65
Site 22									
0.5 - 4.0 m	95.1	5.2	5.1	12.3	7.0	1.31	0.07	0.92	0.21

Deposit and Sample Site	Moisture percent	Ash percent	pH	Absorptive Value dry (X own wt)	Absorptive Value 40 percent Moisture	Saturated Volume Weights-gm/cc			Dry Volume Wt.gm/cc
						As recovered Wr/Vw	Oven Dried Wd/Vw	Wet Ww/Vw	Wd/Vd
Site 23									
1.4 - 1.7 m	95.1	4.6		14.0	8.0	1.64	0.07	0.99	0.17
1.7 - 3.0 m	92.4	3.9	4.9	11.8	6.7	1.11	0.08	0.99	0.27
3.0 - 4.0 m	93.2	3.0		13.4	7.6	1.11	0.07	1.05	0.21
4.0 - 4.5 m	91.4	2.6	4.6	8.8	4.9	1.02	0.09	0.90	0.25
4.5 - 5.0 m	89.0	13.5	5.2	7.8	4.3	1.03	0.11	0.97	0.49
Site 24									
0.5 - 1.0 m	NSS	NSS	NSS	11.4	6.4	0.60	0.08	0.94	0.20
1.0 - 3.0 m	93.6	5.6	5.2	9.2	5.1	1.24	0.10	0.99	0.37
3.0 - 3.8 m	89.8	13.0		8.2	4.5	1.15	0.11	1.01	0.49
Site 26									
0.5 - 1.0 m	82.5	42.6	5.5	4.7	2.4	1.09	0.12	1.02	0.56
1.0 - 2.0 m	NSS	NSS	NSS	7.1	3.9	1.09	0.18	0.87	0.29
2.0 - 3.2 m	89.7	15.9		7.7	4.2	1.24	0.11	1.01	0.33
Site 27									
0.5 - 1.0 m	93.0	4.6	5.2	10.3	5.8	1.27	0.09	1.02	0.32
1.0 - 2.5 m	91.2	6.0	5.2	11.0	6.2	1.20	0.08	1.00	0.30
2.5 - 3.2 m	93.4	8.2	5.3	8.1	4.5	1.89	0.08	0.84	0.34
27: McNEVIN TP.									
Site 1									
1.3 - 1.6 m	91.1	5.3	5.2	10.4	5.8	0.99	0.08	0.92	0.22
Site 2									
0.7 - 1.5 m	91.7	6.6	5.0	3.5	1.7	1.26	0.22	0.98	0.49
1.5 - 2.3 m	91.4	7.5	5.2	8.6	4.8	1.05	0.09	0.89	0.30
2.3 - 2.6 m	83.6	18.6	5.7	7.2	3.9	0.97	0.13	1.05	0.82
Site 3									
0.4 - 1.0 m	88.6	6.1	5.1	7.5	4.1	0.95	0.11	0.91	0.32
1.0 - 1.75 m	90.3	7.2	5.3	8.9	4.9	1.10	0.10	0.95	0.33
Site 4									
0.5 - 0.75 m	87.0	7.0	5.2	7.4	4.0	1.03	0.11	0.96	0.35
0.75 - 1.3 m 1.4 - 1.5 m	88.9	14.7	5.4	6.2	3.3	1.10	0.15	1.09	0.45
Site 6									
0.5 - 1.25 m	87.5	7.9	4.9	7.9	4.3	1.01	0.12	1.09	0.23
1.25 - 1.6 m	83.6	16.2	4.5	5.9	3.1	0.92	0.13	0.89	0.46
Site 7									
0.5 - 1.5 m	91.3	2.9	4.6	10.5	5.9	1.04	0.10	1.12	0.25
Site 8									
0.3 - 0.5 m	92.4	6.3	4.9	8.1	4.4	0.90	0.09	0.84	0.28
0.5 - 1.0 m	92.0	2.4	4.5	9.2	5.1	1.06	0.09	0.97	0.36
1.0 - 1.5 m	91.4	2.8	4.8	11.1	6.3	0.89	0.08	0.94	0.21
1.5 - 1.75 m	91.4	6.0	4.9	9.3	5.2	0.94	0.09	0.96	0.27
1.75 - 2.5 m	90.5	6.6	4.5	13.5	7.7	0.76	0.07	1.00	0.45
Site 9									
0.3 - 0.5 m	90.5	7.2	5.2	14.3	8.2	1.13	0.09	1.40	0.24
0.5 - 1.0 m	92.3	2.5	4.8	8.9	4.9	1.35	0.10	1.01	0.25
1.0 - 1.6 m	91.4	2.3	4.6	10.2	5.7	0.82	0.07	0.77	0.18
1.6 - 2.3 m	92.7	5.1	4.8	9.9	5.5	1.27	0.09	0.96	0.21
2.3 - 2.8 m	89.7	11.3	5.2	7.3	4.0	0.95	0.10	0.87	0.33

Deposit and Sample Site	Moisture percent	Ash percent	pH	Absorptive Value dry (X own wt)	Absorptive Value 40 percent Moisture	Saturated Volume Weights-gm/cc			Dry Volume Wt.gm/cc
						As recovered Wr/Vw	Oven Dried Wd/Vw	Wet Ww/Vw	Wd/Vd
Site 10									
0.5 - 1.0 m	91.3	2.6	4.7	8.6	4.8	1.05	0.09	0.90	0.20
1.0 - 1.5 m	91.8	2.7	4.7	9.0	5.0	1.24	0.10	0.95	0.19
1.5 - 2.0 m	92.2	4.1	4.7	9.6	5.4	1.13	0.08	0.86	0.18
2.0 - 2.5 m	92.6	6.3	4.9	11.3	5.2	1.24	0.10	1.18	0.29
2.5 - 3.0 m	92.6	9.4	5.1	8.4	4.6	1.47	0.10	0.98	0.27
3.0 - 3.25 m	79.9	17.9	5.1	6.5	3.5	1.05	0.12	0.92	0.48
Site 11									
0.5 - 1.2 m	91.3	4.2	5.3	8.5	4.7	1.32	0.10	0.95	0.20
Site 12									
0.6 - 1.5 m	91.8	5.5	4.7	9.9	5.5	1.15	0.09	0.95	0.19
1.5 - 1.8 m	92.1	4.3	5.1	9.7	5.4	1.18	0.09	0.97	0.28
Site 13									
0.75 - 1.5 m	93.0	4.4	5.0	9.6	5.4	1.10	0.08	0.81	0.24
1.5 - 2.6 m	90.3	5.0	4.9	10.3	5.8	1.10	0.09	0.91	0.21
2.6 - 2.8 m	58.3	80.6	5.3	1.9	0.7	1.33	0.41	1.19	0.94
Site 14									
0.5 - 2.25 m	92.1	2.4	4.7	9.5	5.3	1.30	0.09	0.93	0.23
2.25 - 3.1 m	92.3	7.6	5.0	9.9	5.5	1.17	0.08	0.90	0.25
3.1 - 3.4 m	82.1	19.9	5.3	4.0	2.0	1.17	0.20	1.02	0.61
Site 15									
0.6 - 1.5 m	92.7	4.7	5.0	10.0	5.6	1.31	0.09	0.95	0.24
1.5 - 2.3 m	92.7	3.5	4.7	11.3	6.4	1.24	0.08	0.97	0.30
2.3 - 2.6 m	91.8	5.6	5.0	9.6	5.4	1.21	0.09	0.91	0.39
2.6 - 2.8 m	86.9	17.8	5.3	7.5	4.1	1.11	0.12	1.06	0.61
2.8 - 3.0 m	NSS	NSS	5.3	3.5	1.7	1.66	0.23	1.07	0.70
Site 16									
0.5 - 2.3 m	91.9	2.7	4.9	9.9	5.5	1.14	0.09	0.92	0.34
2.3 - 2.4 m	85.8	24.4	5.3	7.6	4.2	1.00	0.11	0.91	0.48
Site 17									
0.5 - 1.2 m	94.9	7.6	4.8	7.4	4.0	0.98	0.11	0.96	0.53
1.2 - 1.4 m	88.5	6.8	5.2	1.03	5.8	1.29	0.09	1.03	0.33
Site 18									
0.5 - 0.9 m	90.1	4.7	5.2	10.9	6.1	0.90	0.09	1.04	0.35
Site 19									
0.7 - 1.5 m	94.0	4.7	5.3	9.8	5.4	1.31	0.08	0.92	0.34
1.5 - 2.0 m	91.9	7.6	5.3	7.4	4.0	1.14	0.10	0.88	0.32
2.0 - 2.8 m	85.1	20.4	5.1	5.9	3.1	1.04	0.14	0.99	0.59
Site 20									
0.75 - 1.1 m	92.4	7.9	5.5	8.9	4.9	1.13	0.09	0.94	0.30
1.1 - 1.4 m	55.0	75.9	5.7	1.9	0.7	1.26	0.45	1.28	0.83
28: CATHCART TP.									
Site 1									
0.5 - 1.0 m	77	44.2	5.78	2.05	0.83	1.065	0.362	1.105	0.59
Site 2									
0.5 - 1.0 m	88	4.41	5.20	9.17	5.10	0.972	0.098	1.006	0.29
1.0 - 1.5 m	85	4.53	5.31	5.05	2.63	0.707	0.147	0.893	0.32
1.5 - 1.75 m	76	39.3	5.13	3.84	1.90	1.085	0.253	1.226	0.71

							Saturated Volume Weights-gm/cc		
Deposit and Sample Site	Moisture percent	Ash percent	pH	Absorptive Value dry (X own wt)	Absorptive Value 40 percent Moisture	As recovered Wr/Vw	Oven Dried Wd/Vw	Wet Ww/Vw	Dry Volume Wt.gm/cc Wd/Vd
Site 3									
0.5 - 0.75 m	88	6.24	5.00	4.40	2.24	0.909	0.172	0.930	0.24
0.75 - 1.0 m	93	9.89	5.40	16.31	9.38	1.045	0.050	0.878	0.06
1.0 - 1.25 m	86	5.73	5.19	5.60	2.96	0.838	0.141	0.938	0.35
Site 4									
0.5 - 1.0 m	NSS	NSS	NSS	6.31	3.38	0.780	0.120	0.880	0.47
1.0 - 1.25 m	91	6.92	5.40	4.73	2.43	1.139	0.173	0.990	0.55
1.25 - 1.5 m	89	6.70	5.40	7.38	4.02	0.936	0.104	0.879	0.27
1.5 - 1.75 m	NSS	NSS	NSS	3.64	1.78	0.807	0.203	0.946	0.75
29: MEINZINGER TP.									
Site 1									
0.2 - 1.4 m	87.4	8.2	5.2	7.2	3.9	1.04	0.13	1.09	0.58
Site 2									
0.25 - 0.5 m	NSS	NSS	NSS	6.4	3.4	1.52	0.12	0.95	0.29
0.5 - 2.0 m	89.2	10.5	5.6	7.8	4.3	1.06	0.11	0.99	0.36
Site 3									
0.3 - 0.5 m	94.1	9.5	4.7	11.1	6.3	1.44	0.08	0.98	0.13
0.5 - 0.7 m	90.1	9.0		7.5	4.1	1.27	0.12	1.01	0.38
0.7 - 1.5 m	87.1	4.6	4.6	7.8	4.3	1.11	0.13	1.10	0.53
1.5 - 1.75 m	86.9	9.7	5.8	7.7	4.2	0.92	0.11	0.93	0.34
Site 4									
0 - 0.2 m	88.0	7.8	4.8	7.6	4.2	1.06	0.11	0.93	0.27
0.2 - 0.3 m	86.2	8.6	5.0	6.9	3.7	1.06	0.13	1.00	0.36
0.3 - 1.75 m	89.3	6.9	5.0	7.0	3.8	1.14	0.12	0.96	0.42
1.75 - 2.25 m	87.6	9.3	5.0	8.0	4.4	1.17	0.13	1.13	0.58
Site 5									
0.3 - 2.25 m	90.6	7.9	5.3	7.4	4.0	1.18	0.12	0.99	0.32
Site 6									
0.5 - 1.75 m	92.3	5.6	5.4	7.2	3.9	1.52	0.11	0.94	0.32
1.75 - 2.5 m	93.8	8.1	5.5	8.1	4.5	1.78	0.11	1.00	0.29
2.5 - 3.0 m	91.3	10.7	5.0	9.0	5.0	1.39	0.10	1.02	0.34
3.0 - 3.5 m	92.2	9.1	5.0	8.8	4.9	1.13	0.09	0.92	0.27
3.5 - 4.0 m	92.8	9.5	5.3	9.4	5.2	1.53	0.11	1.13	0.36
4.0 - 4.3 m	93.1	13.4	4.7	10.3	5.8	1.41	0.09	1.06	0.16
Site 7									
0.35 - 2.0 m	91.8	10.2	5.8	8.3	4.6	1.17	0.10	0.92	0.26
2.0 - 3.1 m	92.7	11.3	5.7	9.8	5.5	1.10	0.09	0.92	0.36
Site 8									
0.5 - 2.7 m	91.6	6.9	5.3	8.0	4.4	1.43	0.11	0.98	0.41
Site 9									
0.25 - 0.35 m	NSS	NSS	NSS	11.2	6.3	1.10	0.08	1.00	0.18
0.35 - 1.0 m	89.9	6.0	4.8	9.4	5.2	1.14	0.10	.099	0.31
1.0 - 1.95 m	90.5	7.1	4.8	8.5	4.7	1.09	0.10	0.98	0.30
Site 10									
0.5 - 1.25 m	91.1	12.6	5.6	6.4	3.4	1.22	0.13	0.98	0.42

APPENDIX IV
SULPHUR, PHOSPHORUS, and CALORIFIC VALUES

Preparation and Procedure

- Crush sample and sieve through 100 mesh, mix sieve portion until homogenous then weigh approximately 1 gm.
- Make pellet from weighed portion.
- Weigh capsule empty.
- Weigh capsule and pellet.
- Net wet equal weight of pellet.
- Load 1341 Plain Oxygen Bomb as per schedule and ignite.
- NOTE initial temperature which will be subtracted from final temperature.
- At end of temperature change release pressure from bomb as per schedule.
- Recover any moisture in bomb for Acid percent titration. Recover any unburnt ignition wire for final calculations.
- Percent moisture is calculated from the difference in weight of a sample and crucible left in an oven at 105-110°C for 12 hrs.
- Sulfur and phosphorous values are on a dry weight basis.
- Calorific values are corrected for moisture.

Deposit	Sample Site	Sample Intercept	S %	P %	Calorific Value cal/g
13	2	0.2 - 2.3	.18	0.06	4903
	3	0.3 - 2.3	.18	0.05	4700
	4	0.2 - 2.2	.18	0.08	4827
15	1	1.0 - 1.5	.57	0.05	4923
	5	0.5 - 1	.25	0.06	4973
		1.0 - 1.5	.13	0.05	5164
		1.5 - 2	.19	0.06	4787
	12	0.5 - 1	.25	0.05	5064
16	1	0.5 - 1	.11	0.04	4501
		1.0 - 1.6	.25	0.05	4453
	5	0.4 - 2	.21	0.05	4731
	4	0.5 - 1.6	.19	0.04	5019
24	1	0.5 - 1.5	.17	0.07	4711
		1.5 - 2.0	.19	0.05	4954
	3	0.5 - 1.5	.17	0.06	5768
		1.7 - 2.4	.23	0.04	4740
	5	0.5 - 2.0	.15	0.06	2726
		2.0 - 4.7	.26	0.04	4321
	6	0.45 - 3	.09	0.04	4929
		3 - 4	.18	0.04	5278
		4 - 4.7	.25	0.05	4826
25	12	0.5 - 1.5	.17	0.07	5429
		1.5 - 1.9	.19	0.10	2360
	15	0.2 - 2.1	.17	0.06	5562
	17	0.6 - 4.25	.11	0.05	5108
	19	1.5 - 4	.13	0.04	5171
	20	0.5 - 3.7	.12	0.04	4194
	22	0.5 - 3.0	.12	0.03	4309
	24	0.5 - 1.0	insufficient material		
		1.0 - 3.0	.12	0.05	5204
		3.0 - 3.8	.17	0.05	4839
	26	0.5 - 1.0	.13	0.06	2676
		1.0 - 2.0	.21	0.06	4950
		2.0 - 3.2	.25	0.05	4808
	27	0.5 - 1	.11	0.05	5033
		1.0 - 2.5	.14	0.03	4075
		2.5 - 3.2	insufficient material		
27	2	0.7 - 1.5	.17	0.06	5052
		1.5 - 2.3	.16	0.05	5223
	6	0.5 - 1.25	.23	0.06	5507
		1.25 - 1.6	.22	0.06	4564
	8	0.3 - 0.5	.21	0.07	5059
		0.5 - 1.0	.15	0.06	3855
		1.0 - 1.5	.16	0.07	5053
		1.75 - 2.5	.16	0.07	3856
	10	0.5 - 1.0	—	—	—
		1.0 - 1.5	.14	0.05	5317
		1.5 - 2.0	.15	0.05	2667
		2.0 - 2.5	.23	0.07	5306
		2.5 - 3.0	.21	0.08	5223
	13	0.75 - 1.5	.12	0.04	5131
		1.5 - 2.6	.16	0.07	5415
	14	0.5 - 2.25	.15	0.05	4938
		2.25 - 3.1	.23	0.06	5229
	16	0.5 - 2.3	.12	0.05	5266
		2.3 - 2.9	.10	0.08	4946
	19	0.6 - 1.5	.18	0.06	5355
		1.5 - 2.0	.21	0.06	5431
		2.0 - 2.8	0.50	0.07	5107
29	2	0.25 - 0.5	.15	0.07	5021
		2.0 - 2.6	.10	0.06	5025
	4	0.3 - 1.75	.16	0.07	5611
		1.75 - 2.25	.28	0.06	5238
	5	0.3 - 2.25	.11	0.05	5156
	6	0.5 - 1.75	.18	0.06	5333
		1.75 - 2.5	.23	0.04	5135
		2.5 - 3.0	.32	0.05	4884
		3.0 - 3.5	.34	0.04	5196
		3.5 - 4.0	.21	0.04	4887
	7	0.35 - 2.0	.16	0.06	2255
		2.0 - 3.0	.21	0.06	4805
	8	0.5 - 2.7	.21	0.06	5118
	9	0.35 - 1.0	.21	0.05	5442
		1.0 - 1.95	.19	0.06	4988

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